

Learning Research Methods via Experience Sharing

L. Giarré* and L. Jaccheri**

* *Dipartimento di Ingegneria dell'Automazione e dei Sistemi
Università di Palermo, Viale Delle Scienze, 90128 Palermo, Italy
giarre@unipa.it, ph. 091-481119; Fax- 091-427940*

** *Department of Information and Computer Science,
Norwegian University of Science and Technology, Trondheim,
Norway. letizia@idi.ntnu.no*

1 Introduction

In this paper we present a web-based arena aimed at describing, comparing and improving the various methods of research that have been employed in different scientific areas. The arena is a the web-forum where phd students and researchers are invited to collaborate by providing their stories, commenting existing stories and reading them, developing the learning mode as a byproduct of the overall process.

2 Research methods and processes

Research processes are learning processes in which experienced researchers, Phd students, master students, and external actors, collaborate to achieve research goals. In the empirical software engineering field, for example, a typical research process involves software professionals (with their artifacts and tools) as actors (or objects of study). The art of research can be learned by a combination of doing and reading research theories and methods. Different research communities rely on different research methods, depending on both the academically field and the tradition of the research institution and group. For example in Scandinavia there is a strong emphasis on empir-

ical based research in all fields, while in Italy there is a stronger theoretical tradition.

In order to learn research methods, one possible way is to provide an infrastructure to share research experience. This infrastructure is based on both face to face and on line mechanisms for sharing knowledge, experience, practice, emotions, support, and opportunities about being researchers. Each research community, being it a local group or an International community is an instance of such an infrastructure. Research methods have been studied and debated at conferences and seminars (top down approach) and between friends and colleagues (bottom up approach).

3 The goals of our work

The goal here is to contribute to the description, comparison and improvement of the different methods of research that have been employed by supporting the exchange of information, collaboration, and cooperation between researchers. We stress the importance of sharing knowledge through storytelling. Well-designed, well-told stories can help others learn from past situations to respond more effectively in future situation. Such stories come in different forms and with a variety of labels e.g. cases, anecdotes, examples, histories or simply experiences.

The topics under investigation are questions related to researchers background, their research methods and processes. Examples of questions are the following:

- How do individuals and group come to research problems?
- How do individuals influence research groups?
- How do research groups influence the individual?
- Which factors and mechanisms contribute to positive/negative culture building and production / lack of production in an interdisciplinary team?
- Which work forms and methods should be chosen in the different phases of a project in order to attain a positive development of the team?
- How do the researchers experience writing texts together?
- What strategies do they use to progress? How do they respond to one another? What type of ownership do they feel about the finished text?

Our work will contribute to the research community by providing a dialog forum, which will be WEB based but also supported by face to face initiatives.

4 State of the Art

Sharing experiences through stories is emerging in various professions as a powerful way to exchange and consolidate knowledge as analyzed in [1]. The use of storytelling is a way of connecting, knowing, and a way to facilitate the processes of nursing education, practice, and research ([2]).

Many Web resources in the last years have turned from simple information points to places for promoting communities. A growing number of studies describe sites that are used to support distributed communities, kept together either by common practices or shared interests. Web sites, providing basic but very effective tools for communication and information sharing together with a virtual meeting place, can successfully support community building and knowledge sharing [3]. At the same time, reported experience also points out the risk of recording information outside a relevant social context. For example, in the field of software engineering experience factories have been suggested as a way to promote knowledge reuse among different projects [4]. However, these resources, many of which are Web based, have proved to be rather problematic and their success strongly depends from the capability of the supporting system of not disconnecting information the social context where this information is created and used. This is pointed out also in an extensive body of literature about community and organizational memories and within knowledge management [5].

There are many initiatives connected to our strategic choice of focusing on research methods. As an example, we cite the European network ESERNET (<http://www.esernet.org>), in the field of software engineering, in which the unit NTNU has been involved. ESERNET. Empirical software engineering (ESE) is a sub field of software engineering which aims at applying empirical theories and methods for the understanding and improvement of the software development process in organizations. ESE build upon statistical, sociological, and computer science theories and it is by its nature a multi disciplinary field as software engineers, industry actors, statisticians, sociologists, and psychologists have traditionally being cooperating. For an extensive introduction to the field, with special emphasis on experiments see [6].

Our experience as Empirical Software Engineering researchers and supervisors for Phd students and our long term cooperation with industry actors tell us that, while there exist a bulk of good literature in the ESE field, cooperation within the research group, cooperation with industry, and relevance of the research problems are actual problems. Too many Phd students work in isolation for many years and deliver theses which are seldom read

by anyone else than the thesis reviewers. We report the empirical software engineering Phd level course, held at both NTNU and University of Oslo since 2002, and described at <http://www.idi.ntnu.no/emner/empse/> as a prototype. Here, a basic ESE syllabus is identified. In addition, creative methods especially thought for innovation and cooperative processes have been exploited. The process has been documented by pictures and videos available at the Empse WEB site.

5 Our Proposal: the Researcher Blog

We propose our way to support the research community by establishing a researcher blog (<http://researcherblog.blogspot.com/>). Our network is open at different research methods and personal research experiences. It aims at investigation of the relationship between research process and research results.

Our network has started in a bottom up fashion and we aim to expand it both bottom up (by involving local and disperse colleagues) and top down (by applying for funding and participation to conferences).

We have contacted local Phd students and researchers. We are in the process of taking contact with different research communities, and try to inform researchers working both in industries and universities/research centers. *Storytelling* is used as the main instrument for our project to investigate the above topics. We publish research stories and by our example we want to stimulate other researchers to share their experience and give us feedback's.

Our first version of the Blog is supported by Blogger.com. The choice is pragmatic. We need to recruit people, locally and globally, to populate the forum and exploit the dissemination. The selected and collected stories, with their feedbacks will be the basis for the design of a better Web support.

Researchers and Phd students from different areas in the Information technology fields (Control, Telecommunication, Computer Science etc.) and of various nationality have been contacted to contribute to it. At the time of writing, the Blog is moderated, but comments are allowed to everyone. We are discussing and experimenting alternative cooperation models, like that of allowing every interested user to submit their stories.

As suggested in [1] three aspects are essential: The *story-crafting*: Effective knowledge-sharing stories are intentionally crafted for the prospective audience. A good knowledge sharing story should be both simple and accessible, offering a streamlined, surrogate experience. The *story-telling* The impact of a story will depend on its telling who tells the story and whether it is shared in an oral or written form. But storytelling also must account

for the size and heterogeneity of the potential audience. The *story-listening* It is critical for storytellers to monitor the reception of their stories. The audience is engaged in creating knowledge while listening, so storytellers and leaders check how this knowledge is being constructed.

6 Final Remarks

In a web forum it is crucial how to recruit students and researchers that would act as both story-listeners and story-tellers. More publicity must be carried out and face to face explanations need to be implemented so that the blog is populated and kept *alive*. The main criticism we have encountered in letting people write is in convincing them about the importance of sharing experience. Most common answers to the question “Why don’t you write down a story for me?” are: “I am not interested in letting others know my business”, “I do not have time..”, “I do not need to learn anything from others..”, “researchers love to do research, and talk about results, not to talk about how they do research”. We recall that: If people do not want to reflect on its own research process you cannot force them and you will never convince them unless you give good examples. Research methods and processes (they are not the same) are important but they should not become *the* only object of research. It is like in life, we combine living with reflecting about life and a right combination must be found.

References

- [1] Sole, D. & Wilson, D., *Storytelling in organizations: The power and the traps using stories to share knowledge in organizations*. LILA, Harvard, Graduate School of Education, 2002.
- [2] Kelly, B., *Storytelling: a way of connecting*. *Nursing Connections*, **8(4)**, pp. 5–11, 1995.
- [3] Girgensohn, A. & A., L., *Social navigation: Making web sites be places for social interaction*. *ACM conference on Computer supported cooperative work*, ACM Press, pp. 136 – 145, 2002.
- [4] Basili, V., Caldiera, G. & Rombach, D., *Encyclopedia of Software Engineering*. Wiley: Berlin and New York, 1994.
- [5] G., S.D., Divitini, M. & Brasethvik, T., *On knowledge management in the internet age*. *Internet-based Knowledge Management and Organizational Memories*, Hershey, USA, 2000.
- [6] *Experimentation in Software Engineering: An Introduction*. Kluwer Academic Publishers, 2000.