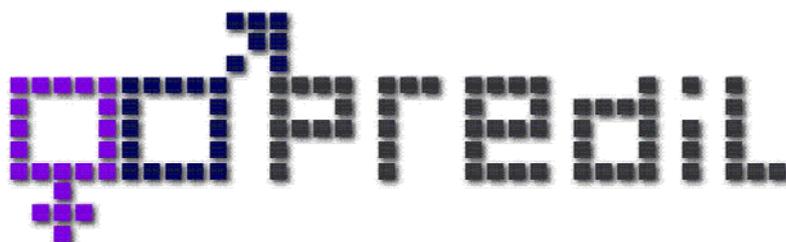


Lifelong Learning Programme

Sub-Programme COMENIUS



PREDIL

Promoting Equality in Digital Literacy

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WORKSHOP PROCEEDINGS

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SUMMARY

This report presents an edited version of the structure and the contents of the forthcoming PREDIL book, to be published by Niemon S.L. in Barcelona in the spring of 2011.

The book structure and contents are based on the contributions of the PREDIL Workshop.

“THE PREDIL BOOK”

Reflections on ICT from a Gender Perspective

The Gender Digital Divide

Understanding and solving the inherent imbalance in take-up of ICT in secondary schools,

by Dr. K. Kikis-Papadakis

PREDIL DESCRIPTION

Objectives

- To increase understanding into the processes that underpin the inherent imbalance in take-up of ICT by boys and girls at secondary and university levels of school.
- To deepen the understanding of pupils’ perceptions of STEM and ICT related fields, their instructional needs with respect to specific subjects, their personal attributions for success/failure in these subjects, and their appreciation of ICT processes and tools.
- To develop a comprehensive, gender-sensitive pedagogical strategy for technology-enhanced teaching/ learning, for the upper levels of secondary education, in an effort to increase students’ motivation in pursuing STEM-related careers.
- To develop a tangible set of guidelines (localized in 20 European National contexts) by which teachers can reflect on girls’ instructional needs with respect to the use of ICT in the learning/teaching process.

Target Audiences

Secondary school teachers who use technology in their classroom teaching practices and students in upper levels of secondary school education who use current technology for learning, in the framework of their school curricula.

Contents

Part A: *Understanding the Current Status of Women in ICT in the Classroom and in STEM-related Careers throughout Europe and other parts of the world*

Chapter 1

ICT Representations of Male & Female Secondary School Students in Slovakia – Peter Nemeč and Lukáš Laš

This chapter provides a snapshot of the quantitative study undertaken in secondary schools (state, private and religious), aimed at the mapping of ICT representations of male and female students in the 15-19 year age group in context with PREDIL's research objectives.

Included among the findings is a research methodology, which includes a school selection process and a means of including them in the online questionnaire. In addition, it will be outlined that a number of supplementary questions have been used in Slovakia in order to determine and compare it with a previous research on Internet use, and to discover students' knowledge of Open Source/Free software. The research sample after data-cleaning had more than 1000 inputs, which were analyzed by statistical software. Important stress has also been placed on the use of online social networks as they are growing in importance as part of our daily lives and could be used extensively in learning-based environment and as motivational tools. The main findings and generalization will be presented, focusing on gender, age, type of school, social, geographical and overall aspects.

Chapter 2

A European Perspective on Gender and ICT- Jim Ridgway

The take-up of careers by women in the computing industry differs across European countries. This chapter outlines the differential take-up in contrasting countries, taking into account the gender imbalance in employment overall, and particularly in terms of seniority and salary levels. The extent to which gender imbalance is a country-specific problem will be examined, as will the places in the education and employment systems where digital divides emerge and are exacerbated. Where data was available, trends have been explored over time. In some countries such as the UK, the overall decline in the popularity of computer courses at university is at least as serious as the problem of gender imbalance. The question of whether a common set of causes of gender imbalance could underpin the different patterns of employment in different countries and the extent to which patterns of gender imbalance in different countries require country-specific explanations will be considered.

Chapter 3

Cultural Influences on Women and Their Relationship with ICT in the USA and Turkey- Sevinç Gülseçen, Nuray Akman

Through examination of research and literature, this chapter seeks to examine women's gender beliefs, careers goals, and occupational attainment in the ICT workforce in both the United States and Turkey. Researchers have concluded that the social and political ideology about gender identity and stereotypes are an important

component of cultural influences on women and their relationship with ICT. Turkey holds a unique position in this debate since Turkey is known to be a male-dominant society, yet research findings show that Turkish women hold a higher share of computer-related occupations compared to other male-dominated occupations such as law, medicine, and engineering. In addition, the presence of professional women in computer programming occupations in Turkey is also high compared to the statistics in the United States and The Netherlands. The chapter shows how researchers have explored the historical, social, and cultural factors contributing to this phenomenon, including the emphasis on gender equality, the political ideology of Turkey with its attendant educational policies that support this ideology, and the family's encouragement of its daughters to be educated in science and technology fields.

It is known that the perceptions of women's roles in society and in the ICT sector are socio-culturally constructed and it can be surmised from a review of the literature that these perceptions vary across countries. Several researchers have concluded that family dynamics and the role of parents are an important component of cultural influences on women and their relationship with ICT. Therefore, while it is apparent that the participation of women in the global ICT workforce is influenced by complex cultural and societal factors that differ from country to country and it is widely acknowledged that it is important to take into account the cultural context, a model has not been specified to determine the role of culture.

Chapter 4

Status of Women in ICT and STEM in North America and Initiatives at U Notre Dame and St. Mary's College- Greg Madey

Throughout most of the ICT and STEM professional workforce, women in North America are under-represented relative to their male counterparts. This chapter provides statistics and trends showing that although some progress has been made, it is modest and inconsistent across the fields. Many national organizations focused on promoting more female participation in ICT/STEM do exist, from committees of major societies (e.g., CRA-W, ACM-W) to those focused on the business workplace (e.g., WITI) or engineering and research professions (e.g., the Anita Borg Institute). Their programs and activities have been surveyed and evaluated in terms of success factors. In addition, a survey of initiatives at the University of Notre Dame and St. Mary's College has also been examined. Although many explanations for the low numbers of women in the ICT/STEM professions are offered, this chapter focuses on two hypotheses and how they guide several initiatives at Notre Dame and St. Mary's to promote greater female participation in the ICT/STEM professions. The first hypothesis is that girls commit or reject ICT/STEM as a potential educational and career path at an early age and after approximately age 12, are unlikely to reverse a rejection of an ICT/STEM path. The second hypothesis states that women view technology as a "means to an end" rather than an "end unto itself". For a woman, technology has value if it solves problems, especially social problems. For men, technology is often a hobby used for fun and entertainment. Also included is a description of the Hypatia Day program at St. Mary's College that targets early aged girls and the Engineering Projects in Community Service (EPICS) activities at Notre Dame, and how they are addressing the situation of under-representation of women in ICT/STEM.

Chapter 5

Research Methodology for Investigating Gender Differences in ICT- Hajnalka Fényes

It is a proven fact that girls have an advantage in education in several fields. Many studies show, that girls are more successful in high school, they have better grades in higher education and according to our “male disadvantage hypothesis”, the social mobility of girls is higher than that of boys (boys study in high schools and in higher education with better cultural and material background). Lastly, a final area where boys may lag behind girls is school efficiency. In the ICT field, the situation is different. Here, more boys study in this field and the grades and test scores of males are better than that of girls. This chapter aims to investigate the possible causes of this phenomenon and try to find the theoretical background and the possible research methodology that will give some answers to this question. With respect to the theoretical background, the chapter examines the role of factors affecting school efficiency (in general), the school efficiency of male and female students, gender differences in competence areas, and finally the possible causes of the greater high school efficiency of girls (in general), based on an examination of current literature.

Regression Analysis is used as a possible research methodology to examine gender differences in the ICT field. The chapter explores the building of regression models and defines the dependent (school efficiency) and independent variables (social background, cultural background, parental background) and how these explanatory variables affect the dependent variable. This methodology also makes it possible to examine the effect of gender role models in family, students’ gender role attitudes, motivations of studying in high school, motivations of further studies, the extent of students’ religious beliefs, the scale of values of students and the students’ attitude to work in ICT performance and career choices.

Chapter 6

Understanding ICT Gender Differences in the Classroom- Mario Barajas

This chapter provides preliminary results of an online survey taken by more than 3300 Secondary school students in eight different European countries in the framework of the PREDIL project. Questions were about their experiences in ICT/computing at school and at home, ICT uses in specific subjects, as well as open questions about advice to teachers to help girls and boys learn about computers, about gender perceptions regarding a career in ICT, on gender views in proficiency in working with computers, and on family factors affecting career choice. Both descriptive quantitative and qualitative analysis (including word-cloud trends) were used. One of the initial results is that despite the efforts made in Europe for ICT take-up in secondary education, its implementation is still quite limited, and that gender differences are relatively unimportant in secondary education. In terms of using ICT at school and at home, surfing the web, email, downloading data, and chatting, are the most popular at school and even more so at home and there is no significant difference from a gender point of view. It was noticed that girls use more word processing and graphic arts, both at school and at home, and communication software. In terms of social software, blogging and creating web pages are starting to be used at school. This implies to some extent that these tools are becoming more and more an educational digital resource. For both girls and boys, messaging and sharing photos are prevalent. Again, very little difference can be seen in the use of social software between boys and girls. Boys tend more to play games and share videos, while girls do more blogging and share music.

Both girls and boys generally coincide on advising teachers to use ICT more in all subjects, care more for their needs, and become more proficient. Girls to a large degree, somewhat more than boys, believe that girls who know about computers are “intelligent”. On the other hand, while both believe boys good at computers are also intelligent, sometimes they are seen as withdrawn, following a diminishing stereotype of the antisocial “geek”. Both genders believe that the future, job opportunities and competency are good reasons to obtain a degree in ICT. Both are keenly aware, girls even more than boys, that pursuing a career in ICT is “the future”, although up to now girls are a minority in the field. Some preliminary conclusions are drawn with respect to the degree of importance of gender differences in school, teachers’ treatment and influences, and perceptions on ICT and career choices.

Chapter 7

The Gender Issue as Related to Free/Libre Open Source Software in France-Jean-Pierre Archambault, Ayuko Sedooka

According to current statistics, in France the domain of Free/Libre Open Source Software (FLOSS) counts only 6% of women, which is significantly less than in the ICT sector overall (25%). This figure is surprising if considering the underlying values of the free software movement that Richard Stallman has been likened to say: “Liberty-Equality-Fraternity”.

Based on qualitative studies, this chapter examines the many gender issues emerging in this area. Results show that there are more women within companies related to free software than in the FLOSS developers' communities, which come with the highest level of prestige. Developers (also named “geeks” in French) are marked by male stereotypes and role models, such as “Robin Hood”. They have been found to develop code as a hobby during their spare time and that this may even bring them some notoriety. It was also found, as elsewhere, that men tend to be more engaged in strategies of power, while women tend to invest more into “peripheral” work like documenting, promoting, linking and educating. This is often vital to the community, but less prestigious. However, the situation is not monolithic and differences may be found between different sub-communities, some of them (in particular in the communication field) being rather active.

Chapter 8

Analysis of the Representations of Males vs. Females in Informatics Education Materials- Kathrin Helling, Bernhard Ertl, Ayuko Sedooka, Mario Barajas

This chapter describes and discusses the results of an exemplary analysis of informatics educational materials from a gender perspective. The study was performed by the Universität der Bundeswehr München in the context of the PREDIL project. Because of the fact that girls and boys show different interests and self-efficacy in using ICT at school and at home, that the up-take of careers in the ICT sector is subject to gender differences and the fact that women are clearly under-represented in the ICT professions and in informatics studies at university, it becomes important to analyze 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. 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. Similar results were found in the current study of the representation of males and females in texts and pictures of secondary level informatics materials in Germany. Two types of materials were considered: materials for pupils (e.g. to be used during classes such as exercises for informatics and ICT-related teaching) and 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. Results show that both types of materials show a bias in the absolute numbers of men and women in texts and pictures. In offline as well as in online materials, the number of men exceeds that of women.

The study concludes that the production and selection of materials for pupils and teachers and the 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 is needed to raise teachers' awareness for gender issues and develop competencies for a gender-reflective use of such materials during lessons.

Part B: Strategic Implications for Policy-Makers and Teachers

Chapter 9

Country Policy Approaches to the Gender, ICT and Education Issues - Cathrine Tømte

This chapter examines the main findings of the CERI New Millenium Learners Project as it pertains to the expert meeting which was organized by the Norwegian Ministry of Education and Research and OECD/ CERI in June 2008, in which the topic of how countries are approaching the gender, ICT and education issues from a policy perspective was highlighted.

The main objective of the project was to conceptualize and analyze from a comparative perspective view, the attitudes, expectations and competencies for Millennials in relation to practices involving communication and knowledge management both in- and outside classrooms. To some extent there is evidence of some kind of homogeneity within the NML-generation in all of the OECD member countries, although this homogeneity is largely influenced by local contexts within the regions and countries. However, an important observation was the appearance of a stereotyped view of boys and girls across most OECD countries. Two issues emerged out of this; namely 1) why is it so? and 2) how should researchers and policymakers deal with this? One major conclusion that arose from the body of work is that the gender issue, as it relates to ICT, is far more complex and heterogeneous than what had been assumed by policymakers and in the plans and strategies in the field of education. This chapter aims to elaborate on some of these findings and suggest some possible guidelines for future policymaking in the educational field concerning gender and ICT.

Chapter 10

How to include Women in our Digital Future - Terry Marsh

The Digital Future promises major societal benefits in areas as wide-ranging as health, culture, education and law. And therefore, access to the internet in order to take advantage of these offerings, is seen to be the driver of any digital inclusion policy. However, the digital world as it exists today, is increasingly being envisioned, designed and built by men, whilst women continue in greater numbers to turn away from studies and careers in digital technology. Policy-makers must take on the challenge of attracting more women into this field to ensure that our digital future is shaped by all, will include all, and consequently will benefit all.

Chapter 11

Implications for Policy Considerations - Kathy Kikis-Papadakis

This chapter draws inputs from the results of the work of PREDIL task forces and discusses implications for policy considerations. The focus is on the European level and examples are drawn from the national contexts of those participating in the project. The axes addressed are a) historical evolution of gender-related policies in the EU, b) the current state of affairs on the Gender Dimension in ICT, c) gender inequalities in relation to ICT, d) gender appropriate teaching practices, e) regulatory conditions, f) existing indicators on gender balances, and g) concerns and challenges for the Educational Agenda in the 21st century. The chapter concludes with a set of policy recommendations for empowering girls to take up STEM-related careers.

Chapter 12

*Promoting Male & Female Students' Interest in Science through Hands-on Experiences-
Manuela Paechter, Gail Jones*

Studies show that across the domains of mathematics and science there are significant gender differences in course grades, interests, and career selection for males and females. One possible way to address these gender differences is by offering science instruction that is attractive to both males and females. Successful programs for females have been shown to center on hands-on science activities, minimize competition between students, and provide them with opportunities to talk with women in science. This chapter describes a study that examines gender differences in the impact of nanotechnology instruction on students' attitudes. To this end, an instructional program on the study of viruses, related mathematical concepts, and the use of nanotechnology tools was designed. The instruction was framed around the unifying theme of scale, including mathematical and qualitative relationships associated with size and scale. Students were engaged in using nanotechnology tools in a multimedia application that allowed them to conduct hands-on investigations with viruses. The tools utilized a remotely controlled atomic force microscope that allowed students to probe and manipulate nanosized viruses.

This program contained elements that were regarded as being discriminatorily preferred by males over females. To widen the appeal to female and to male students, science content was connected to applications, opportunities for hands-on experiences and social interactions with researchers were provided. Four middle school and four High school classes in North Carolina (USA) took part in the empirical testing.

The empirical results showed that there were significant differences in female and male students' interests in using this specific technology. In summary, the results suggest that there is a differential impact of technology tools on students by gender and there is the potential to use tools such as these to increase the appeal of science education for female students.

In summary, the results suggest various measures to widen the appeal of science education for female students. Linking science content to application, providing opportunities for social interactions, and hands-on experiences proved to be interesting for the female high school students in this investigation. Overall, the program proved to be successful in the sense that, firstly, male and female students showed a high interest in the technology and, secondly, that female students showed an even higher shift in their interest than male students.

Chapter 13

Enhancing Female Entrepreneurship in ICT professions through Competency-based Coaching in Secondary Schools - Katharina Ebner

The under-representation of women in ICT-related careers is not merely a generic gender issue, but an important economic topic. New businesses create jobs and enhance an economy's innovative potential, thereby augmenting the entrepreneurial engagement of women would affect an economy positively and hence should be a focus of education experts. As the foundation for careers lays in adolescence and young adulthood, the interest and motivation to deal with ICT and STEM-topics of young girls and women should be accelerated already in schools. According to career theories, career interests of students between the ages of 14 and 18 significantly influence later career decisions. This chapter will give an overview of coaching methods and techniques affecting the identification of interests and motivations. The inter-dependence of coaching interventions, which enhance self-reflection and subsequent competency development will be discussed and crucial self-reflective and competency-sensitive coaching elements will be described. The presentation of a feasible coaching curriculum for girls in secondary school following a structure affecting one's self-directed (technical) competency development concludes the chapter.

Chapter 14

Attracting More Female Students to ICT Careers –Monique Grandbastien

This chapter begins by describing a series of actions that were taken in Nancy University in order to attract more female students to ICT programs. These included "welcome days" in the research lab, dedicated items on the website such as cutting down erroneous beliefs, promoting women who were famous scientists in Computer Science, providing links to videos showing the variety of jobs in ICT, etc. and also new "mixed" curricula for the many students attracted by the biological and health sector. Then the scope is widened towards examining teacher training for updating teachers' attitudes when advising their students regarding career choices and towards societal awareness for changing parents' minds. Finally, since ICT-related jobs are still evolving tremendously, ICT curricula proposed in higher education should also be continuously adapting and any set of actions proposed for attracting more females to ICT careers should take into account the expected evolutions, including those of the educational institutions themselves.

Chapter 15

Modifying Teaching Methodologies to best Serve the Needs of Female Students-Rudolf Pecinovsky

The Department of Information Technologies at the University of Economics in Prague concentrates on education in ICT and IT. Women comprise an interesting part of the student body. Experience shows that they often prefer inductive methods rather than deductive ones. They often do not like to learn general rules that should be applied to concrete cases, but rather prefer to see a set of particular solved examples and then internally derive a general rule for solving these examples. They often cannot formulate this rule, however they can apply it. This is a problem, especially in programming, where the deductive approach is generally preferred.

This chapter shows how we can modify the methodology of teaching to satisfy these needs and how to teach the Object Oriented Programming (OOP) in a less abstract way. The *Design Patterns First* methodology suggests starting the course in an interactive mode, where a student plays the role of an object in a project was taken into consideration. This student-object then sends messages to other objects and in the meantime, he/she learns general rules and properties of OOP, long before ever writing the first line of code.

This chapter also shows how the use of this interactive mode can be used for gradual teaching of various topics: objects as representatives of everything that we can name by a noun including abstract terms (direction, beauty), the object nature of classes, differences between primitive and object types, attributes versus properties, instance members versus static members etc. The chapter shows that this interactive mode allows lucid explanations on even such advanced topics as interface and its intent in the program. As students understand the nature of interface, we can continue with an explanation of basic design patterns. We introduce the patterns used in the actual project and show how the behavior of the project can be improved by incorporating further design patterns.

Chapter 16

Lessons learned from the Gender Awareness in Media Education (GAME) Project-Dorothea Luke, Irena Fialova

Whilst the assessment by the EU agency EACEA acknowledges the outstanding achievement and performance of the GAME project, in hindsight it can be beneficial to look back critically and examine issues which perhaps could have been improved. This chapter recaps the main highlights of the GAME project and introduces and discusses some lessons learned, which could be of concern for teachers interested in Gender & New Media.

The use of ICT and competence in using it are influenced by gender-specific differences.

Traditionally, it is the field of technology which contributes to “making the difference” and creates a clear demarcation line for gender-specific behavior, stereotypical preferences and abilities.

The European Union, in view of their prospects for the future, counts on equal opportunities for males and females in schools, and further education. It is still

necessary to systematically reduce existing role stereotypes in order to be able to place the individual interests, abilities and strengths of the pupils and students in the foreground.

The COMENIUS 2.1 project “**G**ender **A**wareness in **M**edia **E**ducation” (G@ME) focused on an area of education that is increasingly gaining in importance. The project contributed to the topic of gender fair media (ICT) education in Europe by focusing on the promotion of the gender and media competences of teachers and teacher educators. The duration of the Project was from October 2006 till December 2009 with the participation of nine institutions from seven EU countries. Target groups for participation were teacher students/ trainees, teacher trainers and teachers for pupils aged from 10 to 16 (upper primary and lower secondary).

At the end of the course, teacher students, teacher trainers and teachers would be able to:

- Self-observe and diagnose and know the procedures and tools to trace the differences.
- Notice gender specific stereotypes more consciously.
- Learn to use their pupils’ different forms of pedagogical thinking and their expression concerning new media in a constructive way.

In addition, teachers will be competent and interested in using new media as a daily instrument of school life and gender aspects will be recognized in Media Education and ICT curricula and discussed amongst teacher students, teacher trainers and teachers.

The main activities and outputs of the project were:

- Analyze the respective PISA results, studies and relevant curricular aspects and carry out research concerning teacher students and pupils’ pedagogical thinking in the context of the use of ICT, taking into account gender aspects.
- Output: Country reports on the project theme
- Develop diagnostic tools to improve reflection of gender-specific perception and communication for competencies dissemination for future and practicing teachers and teacher educators
- Output: User manual with diagnostic tools on gender specific perceptions, which aims at contributing to gender and media competence raising by sensitizing for the perception of gender specific differences in media education in school and teacher education and by strengthening the diagnostic and self-reflective competencies of future and practicing teachers and teacher educators.
- Development of Comenius 2.2. Course "Gender sensitive Media Didactics in Teacher Education".

Chapter 17

Reasons for the Integration of ICT in Mathematics Education- Ján Guncaga, Janka Majherová

In today’s teaching of mathematics and computer science, there is an objective for students to gain competencies for work with information on the higher level. This means, an ability to connect different areas of mathematics and informatics or to work with various representations of a given problem. This chapter identifies the contribution of ICT and the reasons for the integration of ICT in mathematics education with a focus on application in the inter-subject relationships. The new Slovak curriculum ISCED 3 points out the importance of digital competencies in the field of mathematics and computer science. Didactics of mathematics also highlights aspects of visualization and

simulation of processes with the help of computers. The options of didactic mathematical program packages allow students to work with the models of mathematical objects. Modeling was used on the lessons of algorithms and programming. The important part of the teaching is the specification of the educational goals. This experimental teaching has been implemented at high school and the development of the cognitive process of pupils according to the revised Bloom's taxonomy has been assessed.

Part C: How Policy Can be put into Practice

Chapter 18

Using Computer-based Displays to Provoke Reflections on Careers with Computers- Jim Ridgway

This chapter describes interactive sessions using computer-based displays that have been developed, that present information about the attainment of male and female students in a range of subjects, the take-up of different subject options by girls and boys, and career choices and salary levels. The displays contain a great deal of information that can be explored actively by users. In an interactive way, users are provoked to engage with the evidence by asking students challenging questions about the evidence and by asking them to give careers advice to girls with particular grades in different subjects. These interactive sessions will involve an active exploration of these displays, and participants will be encouraged to think about ways they can include these displays in their own work.

Chapter 19

Gaining Insights into Student Perceptions of Careers in Computing- Sean McCusker

This chapter shows how the use of the software *xtranormal* helped in obtaining authentic insights into student perceptions of careers in computing. A class of 15 year-old students in a local school were asked by their ICT teacher to use *xtranormal* to create a short video with the title 'the ICT professional comes home at night'. The software package allows students to choose the appearance of the characters, their gestures, the scenery in which they are interacting, and the dialogue. When the video plays, the characters act out the students' scripts and speak the students' words. A set of short videos was created during the course of a single 55 minute lesson, by students who were seeing the software for the first time. These videos offer interesting insights into student perceptions which would be hard to elicit via more conventional means such as questionnaires and interviews. The content of the student videos will be used as the basis for a discussion on student perceptions. The chapter will also briefly touch upon how to drive the software. <http://www.xtranormal.com/>

Chapter 20

Remote-controlled Labs as Teacher Support for Encouraging Students' Active Learning- Hans-Jörg Jodl, Sebastian Gröber

Remotely Controlled Laboratories (RCLs) are real-world experiments which can be executed through the use of the internet. User A at a location A is allowed to conduct

an experiment at a distant location B via his/her computer. Controlling of the experiment is enabled by accessing an inter-face and a web server. Webcams allow the user to observe the on-going experiment. This chapter will show how the RCL project portal (<http://rcl.physik.uni-kl.de/>) can support Teacher' encouragement of pupil's active learning in the internet. Objectives of the RCL project include the setting up of experiments which encourage play, excite curiosity, and stimulate motivation (e.g. robot in a maze, "hot wire"). This kind of RCL is devoted to pupils and undergraduate students as well as to interested lay people. In particular, this kind of RCL is a well suited prototype model to build-up own RCL in school projects. A second objective is to realize important experiments of physics teaching which can be immediately used in teaching and learning (school or university), such as the diffraction of electrons, diffraction and interference of light and photoelectrical effect.