Teaching of a computer literacy course in South Africa: A case study using traditional and co-operative learning

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Abstract. The Department of Informatics at the University of Pretoria in South Africa has been involved in a research project funded by the Foundation for Research and Development (FRD) since 1996. The main focus of this project is to establish computer-supported co-operative learning centres in various rural communities. The case study described in this paper discusses a part of this project that was undertaken during 1998. The paper outlines the computer literacy course where co-operative learning and traditional learning methods were used. A discussion about co-operative learning and traditional learning, with specific reference to the implementation of the two methods at SEIDET, is presented. An outline of the research results based on a questionnaire completed by the teachers who took part in the case study, is given. Although most of the teachers preferred the traditional and known method of teaching that was used for the MsExcel part of the course, they indicated that they have learnt more using the co-operative learning method.

1. Introduction

First-world countries, especially the European Union, are investing large sums of money for development in developing countries. Two areas that attract a huge amount of attention are education and information technology. The case study, described in this paper, hints at learning experiences that may give crucial insight into education and information technology. The specific area of education addressed in this case study is computer-supported co-operative learning, which promises to assist developing countries with the problems associated with the introduction of information technology.

The Department of Informatics at the University of Pretoria in South Africa is involved in a research project funded by the Foundation for Research and Development (FRD) since 1996. The main focus of this project is to establish computer-supported co-operative learning centres in various rural communities, the first centre being the Siyabuswa Education Improvement and Development Trust (SEIDET) at Siyabuswa situated north of Pretoria. The case study described in this paper discusses a part of this project that was undertaken during 1998. The aim of the research was to determine whether there are any differences between a traditional learning experience and a co-operative learning experience in a computer literacy course for teachers at SEIDET. The researchers also wanted to know what lessons can be learnt from this learning experience.

The paper outlines the computer literacy course where both of these learning methods have been used. A discussion on co-operative learning and traditional learning follows, with specific reference...
to the implementation of the two methods at SEIDET. An outline of the research results, based on a questionnaire answered by the teachers that participated in the course, is given. The last section draws some conclusions from the lessons learnt through the application of the case study.

2. Computer literacy course

A Computer-Ndaba was organized as part of the research project at Seidet. The word “ndaba” is a Zulu word (a local South African language) and is defined as “a topic of conversation, affair”. The significance of using this word is that all the teachers are called together to discuss, plan and formulate ideas for the use of computers to the advantage of the community and themselves. The computer literacy course that formed a subsection of the Computer-Ndaba (described in Subsection 2.2) took place within the SEIDET community centre.

2.1. Background

SEIDET is a non-profit, non-governmental community-based education improvement institution and a registered development trust [2]. The main objectives of SEIDET are [11]:

– To provide a supplementary tuition programme for Grade 10, 11 and 12 pupils focusing mainly on English, Science and Mathematics in order to enable them to gain admission to tertiary institutions.
– To empower science teachers with basic laboratory skills in order to be able to implement outcome based and learner centred education.
– To provide career guidance, enrichment and life-skills to students and young learners.
– To offer basic literacy and numeracy skills to adults and young learners.
– To encourage community involvement in the education of the young learners.
– To seek sponsorship and placement for its students.
– To forge links and working relationships between the community, tertiary institutions and the private sector on all aspects pertaining to the education of the youth and the community.
– To conduct small-scale research projects with a view to contributing to a larger body of knowledge in the education field in the country.

The Computer-Ndaba formed part of the project named “The development and deployment of computer supported co-operative learning at community learning centres (CSCL project)”, undertaken by the University of Pretoria. This project is funded by the Foundation for Research and Development (FRD) and involves various departments (Department of Informatics, Department of Didactics and the Department of Electrical and Electronic Engineering) at the University of Pretoria. The main objective of the current phase of the project is the establishment of a computer co-operative learning environment at the SEIDET community centre at Siyabuswa to complement the current teaching of endangered subject areas such as Science, Mathematics, English and Biology (not excluding other subject areas) [13]. Further phases include the establishment of more community centres at other rural areas. This was done in 1999 and 2000.

2.2. Computer-Ndaba

The Computer-Ndaba was a project that was planned in accordance with the principles for systems development and implementation for developing communities. These principles were introduced by the
Scandinavian trade union movement. For a full discussion of these principles see [10]. The purpose of the Computer-Ndaba was to help the teachers to develop plans for the use of the computers to their own advantage and to ensure that they become computer literate. The need for the introduction of computers and thus a computer literacy course was identified at the beginning of the CSCL project. During 1997 four computers were bought and a small scale project focusing on Mathematics teachers was launched [8]. This need became more pronounced after the SEIDET centre received a donation for creating a computer laboratory at the end of 1997. The funds were used to build a classroom for the computers, as well as buying 27 Pentium PCs.

A decision was made that the introduction of computers should start with the teachers. The Computer-Ndaba was held, for teachers, from February 1998 to July 1998. Further activities are planned for the future to address certain issues that was identified during the initial period.

The aims of the Computer-Ndaba was to help with the introduction process of the donated computer laboratory. The actors involved in this process were researchers from the University of Pretoria, executive committee of SEIDET and the teachers that formed part of the SEIDET centre. Three issues were discussed during the Computer-Ndaba:

- How will the lab be managed?
- How are we as teachers going to use the lab for our work at the SEIDET community centre?
- How are we as teachers going to learn about PC’s and other aspects relevant to PC’s?

The computer literacy was linked to the last question and was not the main focus of the course. The scope of this paper, however, will be the computer literacy section of the Computer-Ndaba and will not address the other two subjects. The remaining issues are discussed in [9].

The Computer-Ndaba sessions were held on Saturday afternoons from 15h15–17h45 as this was the only time available to the teachers. The dedication and commitment of the teachers to learn about computers can be seen in that Saturday afternoons are usually reserved for sport, family time and that some of the teachers had to travel quite far to come to the sessions. Previous experience has shown that a major soccer event kept most teachers away from such courses and that these courses usually ended with about 40–50% of the teachers who started. In the case of the Computer-Ndaba we lost only 4 teachers out of 42 and even the Saturdays during the Africa Soccer Cup were well attended.

It was planned that each Saturday session of the Computer-Ndaba consisted of two parts: an hour discussion and work sessions on the management and use of the lab. The rest of the time would be spent on the following subjects, which consisted of teaching subjects as well as computer literacy:

- What is learning? What is curriculum 2005? (2 weeks).
- Co-operative learning (2 weeks).
- General computer skills (1 week).
- MsWord (3 weeks).
- MsExcel (3 weeks).
- E-mail (2 weeks).
- Other types of Information Technology, for example CD-ROMs (1 week).

The first subject “What is learning?” and “What is curriculum 2005?” was prompted by the changes to the South African education system that the South African government plans to implement by the year 2005. Two important aspects of Curriculum 2005 are co-operative learning and student centred learning, as depicted in various white papers published by the Department of Education [http://www.polity.org.za/govdocs/misc/curr2005.html] during 1997. To address the issue of co-operative
learning, two weeks were spent on the explanation of the concept to the teachers, as well as giving them practice in the development of co-operative lessons for their particular subjects.

The computer literacy course consisted of general computer skills (keyboard, types of hardware, mouse skills, and introduction to the Windows 95 operating system), Microsoft Word, Microsoft Excel, E-mail and other types of information technology. During the course it became apparent that the teachers needed more time for subjects such as Windows ’95. The last subject, “Other types of Information Technology”, got very little attention.

Different methods were used for teaching the different parts of the computer literacy course. The introduction to the keyboard and mouse was done through a computer assisted instruction program, called Interact, that was developed by the University of South Africa [1]. The introduction to hardware, other types of technology, e-mail and Microsoft Excel was introduced to the teachers by using a data/video projector and an instructor. Most of these sessions included a practical part where the teachers had to complete an assignment. MsWord was introduced to the teachers using two co-operative learning methods, namely Jigsaw and Student Teams-Achievement Division (discussed later in Subsection 3.2). Before the teachers started using these methods, they were introduced to co-operative learning. The introduction consisted of two sessions. The first session consisted of the theory about co-operative learning. In the second session, the teachers practised the theory, by designing a co-operative learning lesson for themselves. The class was divided into subject groups (Biology, Science, English, etc.). Each group chose a subject that was familiar to all the group members. A detailed discussion of the lesson they developed was given after they completed the outline for the lesson.

3. Learning methods used in the case study

As mentioned in the previous paragraph, different learning methods were used during the computer literacy course. The researchers wanted to learn from the case study whether learners experienced the part presented in a traditional learning format differently from the co-operative learning method. Co-operative learning methods will be discussed first, because the first part of the computer literacy course was presented using these methods.

3.1. Co-operative learning

Cooperative learning can be defined as an organizational structure in which a group of students pursue academic goals through collaborative efforts. Students work together in small groups, draw on each other’s strengths, and assist each other in completing the task. This method encourages supportive relationships, good communication skills and higher-level thinking abilities [4, p. 8]. According to Johnson and Johnson [6], the following five basic elements should be present in a cooperative learning environment:

1. **Positive goal interdependence**, which occurs when learners undertake a group task with a feeling of mutuality.
2. **Face-to-face promotive interaction**, which occurs when a verbal interchange takes place where learners explain how they obtained an answer or how a problem may be solved.
3. **Individual accountability**, which means taking responsibility for learning material.
4. **Social skills**, which involve knowing how to communicate effectively and how to develop respect and trust within a group.
5. Group processing to reflect on how well the group is working and to analyze its effectiveness and how it may be improved.

The presence of these elements is important to ensure a successful co-operative learning experience.

Cooperative learning methods are structured and systematic instructional strategies capable of being used in any learning environment. Although the methods are based on social psychological research and theory, they have been adopted to meet the practical requirements of the learning environment. The main objective for all the methods is always the same: *Heterogeneous groups working toward a common goal* [12, p. 8]. These methods include Jigsaw, Students-Teams-Achievement Division, Team-Games-Tournament, Circles of Learning and Group Investigation. These methods have been used and tested extensively in various research projects. The most important advantages of co-operative learning seems to be the positive effect of such an environment on academic achievement, the development of social skills and interpersonal and inter-ethnic relations. A major obstacle for the implementation of co-operative learning may be the teacher’s lack of experience of co-operative learning and group work dynamics. The role of the teacher in a co-operative learning environment changes to that of a mediator, facilitator and coach. The role of the learner changes to that of a collaborator and active participant, sharing knowledge with other learners rather than competing with them. By spending two weeks on the concept of co-operative learning and letting the teachers experience co-operative learning from a learners viewpoint, the researchers tried to explain the role of the teacher and the learner to the group of teachers.

A Saturday afternoon was spent to give the teachers a background of co-operative learning and explain to them the different methods that can be used. They were divided into groups according to the subject that they teach at their respective schools and given the task to use one of the co-operative learning methods to design a lesson in their subject. They had to explain the lesson that they have developed to the rest of the teachers. A lively discussion on the merits of the lesson, the co-operative learning method used and the successful application of the five basic elements of co-operative learning followed. Both the researchers and the group of teachers indicated that they would have liked more exposure and practice in the development of co-operative learning lessons. Time constraints, however, did not allow this.

The Jigsaw method was chosen as the co-operative learning method to teach the teachers something about word processing, using MsWord as the application package. This method was one of the earliest cooperative learning methods. Each member of the group is given unique information on a subject, which is then discussed with their counterparts in the other groups [6]. The following steps are essential for the successful implementation of this method:

1. *Specially designed curriculum materials so that each member of the group has a unique source that can be used independently of other sources:* The MsWord manual was divided into three logical sections covering the different topics that the researchers felt was necessary for the teachers to know. As a very basic introduction to word processing was intended, a lecture was first given to explain to the teachers the use of word processing and to familiarize them with the screen layout of MsWord.

2. *Divide into groups and do group building exercise:* The teachers already knew each other well and have been working in groups during the two weeks spent on co-operative learning. The teachers were divided into groups of three teachers each to facilitate their use of a computer.

3. *Explain to the students the idea of group work:* Two lectures on cooperative learning were given to the teachers before the process of computer literacy was started, as previously discussed.
4. **Explain the goal and the task**: The objectives of the word processing part of the case study were described to the teachers so that they knew exactly what will be required from them in the individual test at the end of this section of the case study.

5. **Use instructional materials to promote interdependence among teachers**: Each group of teachers had only one computer to work on and only one photocopy of the different MsWord functions. Each group member had to study one part of the MsWord functions and was given only the relevant pages from the manual.

6. **Meeting of expert groups doing the same topic**: At this point the researchers deviated from the Jigsaw method because of logistical problems. The teachers involved in the case study lived far apart in rural areas and it was not possible for them to meet during the week. Each expert member of the group was, therefore, requested to study his/her part of the manual on his/her own during the week. The importance of this individual study to the progress of the group was stressed. The group assignment that was the next step in the process could not be done without each expert member’s knowledge.

7. **Evaluate the students’ work**: This was done by means of a group assignment that was given to the teachers. Each teacher had to use his/her specialized knowledge to help the group complete the assignment.

8. **Final evaluation**: The following Saturday an individual assignment was given to the teachers covering the same work that they had done for the group assignment.

9. **Assess group functioning**: This was done through ongoing observation while the groups were busy with the course, as well as through the completion of a questionnaire by each individual at the end of the course.

The five basic elements of cooperative learning were implemented in the following ways:

(a) **Positive goal interdependence**: This was achieved by having the group produce a single assignment at the end of the word-processing section.

(b) **Face-to-face promotive interaction**: Learners each had to study certain MsWord functions and explain and demonstrate them to the other group members.

(c) **Individual accountability**: An individual test was given at the end of the course to test their ability to use the word-processing functions.

(d) **Social skills**: The group members were given time to get to know each other. Each group member got a turn to explain some word processing functions to the other group members.

(e) **Group processing**: The behaviour of the groups was monitored continually by the researchers. Assistance was given when necessary in the form of clarification of instructions, answering of questions, encouragement and teaching of academic skills.

The results and feedback of the teachers on this part of the case study are given in Section 4.

3.2. **Traditional learning**

The traditional way of teaching computer literacy is to use a teacher to describe the actions that should be taken by the learner in front of the computer. A new development in teaching computer literacy is using technology such as data/video projectors or software that can switch between the screen of the teacher and the screen of the learner. In traditional learning a number of characteristics can be identified. Table 1 outlines some of these characteristics [5].
Table 1
Characteristics of traditional learning

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Traditional (lecture) method of teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of teacher</td>
<td>As teacher:</td>
</tr>
<tr>
<td></td>
<td>Directs thinking</td>
</tr>
<tr>
<td></td>
<td>holds all knowledge</td>
</tr>
<tr>
<td></td>
<td>evaluates students</td>
</tr>
<tr>
<td>Role of student</td>
<td>As receiver of knowledge:</td>
</tr>
<tr>
<td></td>
<td>inert</td>
</tr>
<tr>
<td></td>
<td>inactive</td>
</tr>
<tr>
<td></td>
<td>empty</td>
</tr>
<tr>
<td>Cognitive focus</td>
<td>Students replicate received knowledge and apply in testing situation</td>
</tr>
<tr>
<td>Metacognitive focus</td>
<td>Passive learner. Study skills are the responsibility of the student</td>
</tr>
<tr>
<td>The role of the students when</td>
<td>Learning things outside personal experience or “over there”</td>
</tr>
<tr>
<td>faced with a problem description</td>
<td></td>
</tr>
<tr>
<td>Problem descriptions</td>
<td>Well structured</td>
</tr>
<tr>
<td></td>
<td>Presented as a challenge to retention</td>
</tr>
<tr>
<td>Organisation of information</td>
<td>Organised and structured by the lecturer</td>
</tr>
</tbody>
</table>

Two ways of teaching a software package can be identified. The first is to give an outline of what the student as an individual should achieve and then give an assignment where they practice these concepts. The second is by introducing each concept. After the introduction of each concept, the learner must practice the particular concept. A final assignment is given to practice the combined concepts. In each of the cases the teacher has a problem, namely at what level to pitch the lesson – for the slow learner, for the average learner or for the fast learner? It does not matter which level is chosen, there will always be two groups of learners that will be frustrated.

The MsExcel sessions of the Computer-Ndaba were done using the traditional method of teaching and introduced MsExcel using a concept by concept method. The teacher used a data/video projector. A manual was given to the teachers, but they received their knowledge and instructions from the teacher.

4. Results of the case study

The teachers participating in the research project had to complete a questionnaire at the completion of the six month period that they had been involved in the Computer-Ndaba. The questionnaires were handed out to the teachers and they were asked to fill them in and hand them back. The total number of teachers that completed the Computer-Ndaba was 38, while the number of questionnaires received back from the teachers was 27. The questionnaire consisted of closed and open-ended questions and the results are given in the next two subsections.

4.1. Results of closed questions

The closed questions covered the background of the teacher, the comparison between the teaching method used in MsWord and MsExcel and the teachers’ experience with group work and co-operative learning in general.
Table 2
Computer experience

<table>
<thead>
<tr>
<th>Experience in computer use</th>
<th>Number of respondents in this category</th>
</tr>
</thead>
<tbody>
<tr>
<td>No experience</td>
<td>10</td>
</tr>
<tr>
<td>Six months</td>
<td>5</td>
</tr>
<tr>
<td>One year</td>
<td>2</td>
</tr>
<tr>
<td>Eighteen months</td>
<td>2</td>
</tr>
<tr>
<td>More than eighteen months</td>
<td>1</td>
</tr>
<tr>
<td>Did not answer the question</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3
Teaching method

<table>
<thead>
<tr>
<th>Question</th>
<th>Respondents’ result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which teaching method did you like the most?</td>
<td>MsWord: 9</td>
</tr>
<tr>
<td></td>
<td>MsExcel: 15</td>
</tr>
<tr>
<td></td>
<td>Both: 3</td>
</tr>
<tr>
<td>Did you feel more comfortable in the MsExcel sessions than with the MsWord sessions?</td>
<td>Yes: 16</td>
</tr>
<tr>
<td></td>
<td>No: 11</td>
</tr>
</tbody>
</table>

The background information consisted of the number of months of experience in computer use and whether they have worked in groups before. A total of 21 out of the group of 27 respondents have prior experience of working in groups and 6 have not worked in groups before. The computer use was divided into 5 categories. Table 2 gives an outline of the responses. Most of the teachers that attended the Computer-Ndaba had no experience with computers. There were a few who were proficient with using computers.

The results of the questions about the comparison between MsExcel and MsWord are given in Table 3. From these responses it can be concluded that the teachers preferred the traditional method of teaching used for MsExcel more than the co-operative learning method for MsWord.

The questions about the teachers’ experience with group work and co-operative learning in general can be divided into two groups. One question asked about the way in which the groups were formed and required only a yes or no response. The question tested whether they would have liked to form their own groups. Out of the 27 respondents 6 would have liked to form their own groups. The rest of the questions was answered using a four point scale – 4 (Always/Definitely), 3 (Frequently/Nearly almost), 2 (Occasionally/Seldom), 1 (Never). The questions and their results of the questions are given in Table 4.

The results about the teachers’ experience with the co-operative learning are very positive, since none of the questions has a lower average than 3.1. The expectation for these questions was that it would have been very low especially if the result of the comparison between the teaching method of MsExcel and MsWord is taken into consideration. It could thus be said that the teachers enjoyed the experience, but that they prefer the traditional method. This result can be supported by the comments made by the teachers in a final questionnaire in which we determined whether their expectations were met. In this questionnaire they specifically commented on the value added by the co-operative learning methods used during the Computer-Ndaba. Subsequently they incorporated co-operative learning methods in other teaching activities at SEIDET.
Table 4

Results of closed questions

<table>
<thead>
<tr>
<th>Number</th>
<th>Question</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I have learnt more in the group than I would have learnt on my own</td>
<td>3.19</td>
</tr>
<tr>
<td>2</td>
<td>I enjoyed working in a group</td>
<td>3.5</td>
</tr>
<tr>
<td>3</td>
<td>The group motivated me to do my share of the work</td>
<td>3.3</td>
</tr>
<tr>
<td>4</td>
<td>The group work helped me understand the study material better</td>
<td>3.3</td>
</tr>
<tr>
<td>5</td>
<td>I learned to cooperate with other teachers</td>
<td>3.6</td>
</tr>
<tr>
<td>6</td>
<td>It was fun working in a group</td>
<td>3.4</td>
</tr>
<tr>
<td>7</td>
<td>In the group I got the benefit of everyone’s ideas</td>
<td>3.3</td>
</tr>
<tr>
<td>8</td>
<td>I got help from group members with problems</td>
<td>3.3</td>
</tr>
<tr>
<td>9</td>
<td>The work got done faster and more work was done</td>
<td>3.3</td>
</tr>
<tr>
<td>10</td>
<td>The group work gave me an opportunity to talk and discuss the study material</td>
<td>3.5</td>
</tr>
<tr>
<td>11</td>
<td>The group work made the study material more interesting</td>
<td>3.4</td>
</tr>
</tbody>
</table>

4.2. Results of open-ended questions

Full details of the answers to the open-ended questions are given in the Appendix. The majority of teachers thought that group work was introduced in this specific course so that they can share ideas and opinions. A number of them also realized that the presentations on co-operative learning and curriculum 2005, together with the practical experience in these concepts offered by the course, should equip them with the skills that they would need for outcomes-based education. The sharing of ideas was also the most liked part of the group work. They also felt that they had gained more knowledge working in a group and that the help received from other group members were valuable to them. They had problems in the groups with passive members who did not share their ideas, as well as dominating members.

On the question whether they thought this experiment was successful, they indicated that they had gained a lot of experience from the other group members and that group work is important when solving problems. Most of the teachers felt that they would like to introduce group work in their schools because skills such as problems solving, active participation, leadership and expressing of views can be taught to school pupils. They also agreed that computers can be used successfully in groups especially for the sharing of ideas and the help that pupils can provide to one another.

Most of the teachers preferred the traditional teaching method used for MsExcel more than the co-operative method used for MsWord, although some of them mentioned the fact that the MsExcel course was “spoon feeding”.

4.3. Results of tests

The teachers took a number of tests during the Computer-Ndaba. A number of assessments were given for the MsWord sessions. The teachers requested this because they felt unsure about their knowledge of MsWord. A total of 3 assessments were given compared to only 1 for MsExcel. The average obtained for the MsExcel individual test was 54%, whilst the average for MsWord was 47%. A final examination was written in MsWord and MsExcel with the respective results being 47% and 46%. These results surprised the researchers compared to the results of the questionnaires as discussed in the previous paragraph.
5. Conclusion

In the introduction we indicated that the research question we would like to answer was: are there any differences between a traditional learning experience and a co-operative learning experience in a computer literacy course for teachers at SEIDET, a rural community in South Africa? The researchers also wanted to know what lessons can be learnt from this learning experience? What have the researchers learnt from this experience?

The philosopher Martin Heidegger used the terms “ready-at-hand and present-at-hand to distinguish between tools that are unobtrusive extensions of our body, and objects that we attend to” [3, p. 116]. It was clear from the results of the questionnaires that co-operative learning was still present-at-hand and had not yet become ready-at-hand. Some possible reasons are:

- The teachers felt more comfortable with the traditional teaching method used for MsExcel.
- The teachers wanted more time spent on the MsWord part of the course.

From this the researchers may conclude that more time should have been spent on co-operative learning methods and that teachers used to traditional teaching methods find it difficult to change their habits. These findings correspond with the experiences of Kay and Black [7] with novice computer literacy learners.

Is it, therefore, worthwhile for first world countries and research institutions (e.g., FRD) to invest large sums of money in projects where co-operative learning is used in teaching computer literacy in developing countries? Preliminary results from this case study show that it is worthwhile to do research of this nature. Although the teachers indicated that they did not prefer the co-operative method, the results of the assessments were not significantly different. It will also be necessary to perform follow-up research questionnaires to determine the long term effect of co-operative learning in this type of environment.

In summary the final research question can be answered: what lessons can be learnt from this learning experience?

- More time should be spent on co-operative learning to ensure that it becomes ready-at-hand.
- In comparing the results of the test for MsWord and MsExcel, no significant improvement can be identified.
- Although the teachers felt uncomfortable with the new method of teaching, they preferred it and liked working in groups.

As a result of this project, teachers were trained during 1999 by a private company to act as instructors for computer literacy courses at SEIDET. From the beginning of 2000 these courses are offered regularly to members of the community and secondary school pupils receive basic computer literacy on Saturdays. Teachers incorporate co-operative learning methods in their teaching of these courses.

Appendix

The following methodology was used for the categorization of the responses to the open-ended questions as identified by Weber [14]. The basic unit used for the classification of the written answers of the teachers was phrases that could be a whole sentence or part of a sentence. The way in which the phrase was identified was as a group of words describing a specific concept. Each phrase was classified in one and only one category. The categories into which the problems were categorized were identified after preliminary investigation of the answers that were given by the students.
The responses of the teachers were coded by the authors. The coding by the researchers was compared and any problems with the coding was solved by revising the categories. The reliability, in terms of stability and reproducibility of the result, was ensured by using two researchers for the coding and comparing the results of the questionnaire.

Summary of responses to open-ended questions

Why do you think group work was introduced in this course?
Sharing of ideas and opinions (12);
To equip teachers with the skills required for curriculum 2005 (9);
To do practically what we learnt;
Check the effectiveness of group work.

What do you like about working in groups?
Other members of the group help you with concepts that you do not understand (4);
You learn to help other students;
More knowledge has been acquired (5);
Weaker learners are motivated by the others;
Sharing of ideas (17);
Makes learning fun and quick.

What don’t you like about working in groups?
Some members of the group are passive and do not contribute (12);
Sometimes faster learners do not consider the slower learners;
Working as equals;
The pace is sometimes slow (3);
Domination of some tutors in the group (6);
It is making a lot of noise.

Do you think this experiment with group work was successful?
Yes, co-operative learning is important in the solving of problems (5);
If it wasn’t for the help of others, one would be stuck a lot of times (2);
A lot of experience was gained from other group members (13).

Would you like group work to be introduced in your school to teach children?
Yes, in all subjects, because the skills that have to be taught include problem solving, active participation, leadership, express their views, etc. (17);
Specific subjects mentioned were Mathematics, Biology, Science, English, Geography;
Promote acceptance and motivation among learners;
Group work will reduce the work load;
No, not immediately.

Explain what you liked about computer-assisted instruction and what you didn’t like
Requires concentration;
Practice is needed to complete successfully;
Made the course a bit easier (6);
There was not enough time allocated to this aspect of the course (3).
Do you think computers can be used successfully in groups as opposed to individual instruction?
Yes, students can still share ideas and help each other (13);
Individual work can be done once a student has grasped all the concepts;
Yes, if it is complemented with the relevant handouts;
Learn more in groups (2);
A large group of students can be accommodated (2);
No, because everybody wants to touch the keyboard, pace of learning differs, shortage of computers in schools (2).

What do you think will be the advantages and/or disadvantages of using computer-supported group work in a school environment?
Pupils will be able to communicate with the outside world (3);
Work can be done quickly;
Will make the work easier;
Pupils will be able to think critically and independently;
Save time, money and space;
Lack of material;
A lot of money is needed;
It is time consuming;
Pupils may not contribute equally.

Why did you like the specific method most?
I chose Excel, because the work done on time tables and schedules are a large part of the tutors work, it was simple and straightforward;
I chose Word, because I could type quickly and use the instructions from the menu bar, it was easy to comprehend, didn’t encounter many problems.

Why did you feel more comfortable?
I felt more comfortable in the Excel because the lecturer wasn’t speeding through the work;
Excel is more appropriate to the teacher’s line of work (2);
I chose Excel because it is easier to learn (5);
I have enjoyed both sessions;
I did not like the Excel sessions because traditional learning was used and it took away the initiative from the learners, I have learnt more in the Word session (2).

Why did you answer yes or no?
It is important to know each function in the Word sessions, otherwise you cannot do something or understand the concept (10);
It will help me to use the computer in future.

References

About the authors

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