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**An Investigation of an ICT In-service Teacher Training
Programme in Greece: a case study.**

by

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A thesis submitted for the degree of Doctor of Philosophy in Education

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Centre for New Technologies Research in Education

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Table of Contents

CHAPTER 1: INTRODUCTION TO THE THESIS.....	1
1.1 Introduction.....	1
1.2 Overview of the Thesis.....	1
1.3 The Origin of the Research Proposal.....	3
1.4 The Aim of the Research.....	4
1.5 The Structure of the Greek Educational System.....	6
1.5.1 Administration and Responsibilities.....	6
1.5.2 IT in the Greek Education System.....	10
1.5.3 The Evaluation of these Training Schemes.....	21
1.5.4 The Provision of ICT in Greek Universities.....	22
1.6 The Importance of the Research.....	23
1.7 Chapter Summary.....	24
CHAPTER 2: LITERATURE.....	25
2.1 Introduction.....	25
2.2 Literature relevant to Educational Change and Reform.....	25
2.2.1 Types of Change.....	26
2.2.2 The Process of effective Change and Reform.....	27
2.2.3 Teacher Professional Development.....	37
2.3 Research on the Introduction of ICT and its Use in Classroom.....	40

2.3.1 Teachers' Conceptions about the Potential of ICT.....	48
2.3.2 Factors that Prevent Teachers from Using ICT in Classroom.....	50
2.4 Teachers as the Key for Implementation of ICT in Classroom.....	56
2.5 Initial and In-service Training of Teachers as a Factor Promoting ICT Integration in Classroom.....	57
2.5.1 Initial or Pre-service ICT Teacher Training.....	59
2.5.2 Models and Modes Employed in Teachers' In-service Training.....	60
2.6 Chapter Summary.....	69
2.6.1 Main Issues Emerging from the Literature.....	74
2.6.2 Addressing Existing Gaps.....	75
CHAPTER 3: THE METHODOLOGY OF THE RESEARCH.....	77
3.1 Introduction.....	77
3.2 Overview of the Research.....	78
3.3 Main Study.....	83
3.3.1 The Selection of the Most Appropriate Method and Technique.....	86
3.3.2 Combination of Qualitative and Quantitative Methods.....	91
3.3.3 The Chosen Methods and Techniques.....	95
3.3.4 Ethical Considerations.....	105
3.4 Chapter Summary.....	107
CHAPTER 4: METHODS OF ANALYSIS.....	108
4.1 Introduction.....	108

4.2 The Methods of Analysis.....	108
4.3 The Method of Reporting.....	116
4.4 Generalisability.....	118
4.5 Reliability and Validity.....	119
4.6 Chapter Summary.....	120
CHAPTER 5: TEACHERS' PERCEPTIONS OF THE TRAINING.....	122
5.1 Introduction.....	122
5.2 Teachers' Characteristics and Motivation.....	122
5.3 perceptions of the EE training Programme.....	127
5.3.1 The Training Structure and the Teaching Methods Used.....	128
5.3.2 Lessons Incorporating ICT.....	135
5.3.3 Further Training.....	137
5.4 Teachers' Perceptions of their Teacher-trainer.....	138
5.5 Teachers' Perceptions of their Schools.....	140
5.5.1 Access to ICT Resources.....	140
5.5.2 Lack of Time.....	145
5.5.3 Lack of Pressure and Support.....	147
5.5.4 The Demands of the Curriculum.....	151
5.6 Perceptions of EE Programme Impact.....	152
5.6.1 At a Personal Level.....	152

5.6.2 At School Level.....	161
5.7 Teachers Who Use Computers.....	162
5.8 Chapter Summary.....	165
CHAPTER 6: DATA FROM HEAD-TEACHERS' POINT OF VIEW.....	167
6.1 Introduction.....	167
6.2 Information about the Traits of the Head-teachers.....	167
6.3 The Head-teachers' Perceptions about the Educational Potential of ICT.....	169
6.4 The Impact of EE ICT Training.....	171
6.5 Factors that Make Teachers Avoid Using ICT in Subject Teaching.....	173
6.5.1 Lack of Appropriate Infrastructure.....	174
6.5.2 Lack of Time.....	176
6.5.3 Lack of Support.....	176
6.5.4 The Demands of the Curriculum.....	178
6.5.5 The General Culture of the Greek School.....	178
6.6. Perceptions of Teachers' Motivation.....	180
6.7 Suggestions Regarding Improving of the Training.....	181
6.7.1 Each Participant should be Provided with a Computer.....	182
6.7.2 Training should be a Continuous and Life-long Process.....	182
6.7.3 The Training should be carried out in the Appropriate Environment.....	183
6.7.4 Greater Emphasis should be put on the Practical Aspect of the Training.....	183
6.7.5 Training should create Incentives for Participation.....	184

6.8 Chapter Summary.....	185
CHAPTER 7: DATA FROM TEACHER-TRAINERS' POINT OF VIEW.....	186
7.1 introduction.....	186
7.2 Teacher-trainers' Perceptions about the Educational Potential of ICT.....	186
7.3 Teacher-trainers' Preparation.....	188
7.4 Information about the Carrying-out of the EE In-service Training.....	189
7.4.1 Problems related to its Preparation.....	190
7.4.2 Problems related to the Programme's Realisation.....	192
7.5 The Evaluation of the EE ICT Training Programme and its Impact on School life	199
7.6 The Teacher-trainers Suggestions.....	203
7.7 Chapter Summary.....	204
CHAPTER 8: DATA FROM PROGRAMME DESIGNERS' POINT OF VIEW...205	
8.1 Introduction.....	205
8.2 EE and TSC Programme Designers' Views of ICT In-service Training.....	205
8.3 The Impact of the Training Programmes on Schools' Life.....	210
8.4 Conceptions of Programme Designers about the Problems related to the Training's Realisation.....	211
8.5 Programme Designers' Suggestions for Good Practice within ICT In-service Training.....	213

8.5.1 The Need for an Active and Appropriate School Head-teacher.....	213
8.5.2 The Participation of many Teachers in the Training programme from the same School.....	213
8.5.3 The Provision of the Necessary Technical Support.....	214
8.5.4 The Provision of Teachers with the Necessary Tools.....	215
8.5.5 The Changing of Teacher Beliefs.....	215
8.6 Chapter Summary.....	216
CHAPTER 9: THE ANALYSIS OF THE DATA.....	217
9.1 Introduction.....	217
9.2 Collated Findings.....	217
9.3 Sharing of Perspectives.....	228
9.4 Key Findings.....	229
9.5 Explaining Relationships through Concept Maps.....	234
9.6 Expanding the Map.....	239
9.7 Summarising Findings.....	241
9.8 Chapter Summary.....	244
CHAPTER 10: DISCUSSION.....	245
10.1 Introduction.....	245
10.2 Table Comparing Findings and Literature.....	245
10.3 The EE ICT Teacher Training Programme and the Greek Educational Policy.....	254

10.4 Observations on Greek Educational Policy.....	255
10.4.1 The Specific Case of ICT In-service Training Programme.....	262
10.5 Greek Schools and Teacher Culture.....	267
10.5.1 The EE ICT Teacher In-service Training.....	272
10.6 Teachers at the Heart of Change.....	276
10.7 Chapter Summary.....	281
CHAPTER 11: CONCLUSION.....	282
11.1 Introduction.....	282
11.2 Recommendations.....	291
11.3 Literature Contribution.....	294
11.4 Methodological Contribution.....	295
11.5 Limitations of the Study.....	296
11.6 Further Research.....	298
11.7 Chapter Summary.....	299
Bibliography.....	300
APPENDIX I.....	333
Observation Schedule.....	333
APPENDIX II.....	337
I. Questionnaire in English.....	337
II. Questionnaire in Greek.....	348
APPENDIX III.....	359

I. Questions for teachers in English.....	359
II. Questions for teachers in Greek.....	362
APPENDIX IV.....	364
I. Questions for head-teachers in English.....	364
II. Questions for head-teachers in Greek.....	366
APPENDIX V.....	368
I. Questions for trainers in English.....	368
II. Questions for trainers in Greek.....	371
APPENDIX VI.....	374
I. Questions for programme designers in English.....	374
II. Questions for programme designers in Greek.....	376
APPENDIX VII.....	378
Initial Coding Categories.....	378
APPENDIX VIII.....	379
APPENDIX IX.....	381
APPENDIX X.....	384
Aggregated teacher comments on lessons incorporating ICT.....	384

List of Figures

Chapter 1

- Figure 1.1: The broad structure of the Educational system (source: Educational Research Centre, 2002)..... 8
Figure 1.2: The levels of education (source: Educational Research Centre, 2002)..... 9
Figure 1.3: Programmes employed for the Implementation of ICT in teaching.....20

Chapter 2

- Figure 2.1: Twining's terminology.....92

Chapter 5

- Figure 5.1: Age profile of teachers.....123
Figure 5.2: Years of teaching experience..... 124
Figure 5.3: The proportion of teachers who considered that computer at home was not essential for them to use ICT in school.....125
Figure 5.4: The proportion of teachers who thought that training programme was too long.....129
Figure 5.5: The proportion of teachers who thought that too much material was covered.....129
Figure 5.6: The proportion of teachers who thought that they were successfully completing tasks.....131
Figure 5.7: The proportion of teachers who thought that there was a need for more examples of ICT in the classroom.....133
Figure 5.8: The proportion of teachers who thought that there were not many opportunities for using ICT in subject teaching..... 134
Figure 5.9: The proportion of teachers who thought that EE focused on IT skills.....135
Figure 5.10: The proportion of teachers who thought that the teacher-trainer had insufficient knowledge on their subject.....139
Figure 5.11: The proportion of teachers who thought that the infrastructure was not sufficient to use ICT..141
Figure 5.12: The proportion of teachers who had experienced problems with the Internet connection.....141
Figure 5.13: the proportion of teachers who thought that there was enough software they could use.....144
Figure 5.14: The proportion of teachers who thought that there was not enough time to use ICT.....146
Figure 5.15: The proportion of teachers who thought that concerns over technical problems inhibited their ICT use.....148
Figure 5.16: The proportion of teachers who thought that they did not learn a lot.....153
Figure 5.17: The proportion of teachers who thought that EE did not enhance their pedagogy on ICT.....155
Figure 5.18: The proportion of teachers who thought that EE was sufficient to enable them use ICT in teaching.....155
Figure 5.19: The proportion of teachers who thought that they could be using ICT.....156
Figure 5.20: The proportion of teachers who thought that ICT could motivate pupils.....159
Figure 5.22: The proportion of teachers who thought that ICT could make the lesson more enjoyable.....160
Figure 5.22: The proportion of teachers who thought that there were no opportunities for cooperation.....161

Chapter 9

- Figure 9.1: Mapping perspectives.....238

List of tables

Chapter 3

Table 3.1: The role of the selected people in the training design and implementation.....	81
Table 3.2: Chronological development of the research.....	82
Table 3.3: The training in numbers in 2003.....	83
Table 3.4: The sample in phases and schools.....	84

Chapter 4

Table 4.1: Explanation of expression of quantified findings.....	118
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Chapter 9

Table 9.1: Explanation of expression of percentages in symbols.....	219
Table 9.2: The perspectives of the groups of participants according to themes.....	227

Chapter 10

Table 10.1: What the literature says concerning the planning of a training programme and the research findings.....	247
Table 10.2: What the literature says for the planning of the sessions and the research findings.....	249
Table 10.3: What the literature says concerning the carrying out of a training programme and the research findings.....	250
Table 10.4: What the literature says for the implementation of ICT in teaching and the research findings...	251
Table 10.5: What the literature says concerning evaluation and the research findings.....	252

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Declaration

This dissertation is presented in accordance with the regulations for the degree of doctor of philosophy. I declare that the work described in this dissertation is original and my own, unless otherwise indicated. I confirm that this dissertation has not been submitted for a degree at any university. The interpretations in this dissertation are the sole responsibility of the researcher, and in no way represent the views of the case-study organisation, nor of the Warwick Institute of Education.

Abbreviations

BECTA	British Educational Communications Technology Agency
CTI	Academic Research Institute on Computer Technology
EE	Endoscholiki Epimorphosi
ERC	Educational Research Centre
EU	European Union
INE-GSEE	Labour Institute of the General Labour Confederation of Greece
ICT	Information and Communication Technology
INSET	In-service Training
IT	Information Technology
KEPE	Centre of Planning and Economic Research
LEA	Local Educational Authorities
NGfL	National Grid for Learning
NOF	New Opportunities Fund
OECD	Organisation for Economic Cooperation and Development
OEPEK	Teachers' Training Organisation,
OLME	Federation of Secondary Education Teachers
PEK	Regional Training Centres
PI	Pedagogical Institute
RED	Regional Educational Directorate
SCPS	Supreme Committee of Personnel Selection
TSC	Training Support Centre
TTA	Teacher Training Agency
UAE	United Arab Emirates
UFSP	Unified Framework Studies Programme
YPEPTH	Ministry of Education and Religious Affairs

ABSTRACT

This thesis investigates an in-service teacher training programme for using ICT in subject teaching in Greek schools. The programme was aimed at teachers of Greek philology and lasted for an academic year. Its aim was to enable teachers to use ICT in their teaching.

The study begins with a literature review of both educational change and ICT in education.

It reaches in conclusions on appropriate strategies of developing the use of ICT in schools.

Next a methodology chapter reviews the nature of case studies and explains the mixed methods approach in this thesis. Findings are then reported. First, the perceptions of teachers who took part in the training. Next, the perceptions of their teacher-trainers. Next, the perceptions of the head-teachers in the schools in which the teachers worked. Finally, the perceptions of the people who designed the training programme.

The report shows both shortcomings and positive aspects of the training and in particular points to the very limited impact it had on teachers' practice. A concept map offers a clearer picture of the data while illustrating any causal relationships.

A further investigation of the Greek educational culture is offered and this provides a new dimension for understanding the results.

CHAPTER 1: INTRODUCTION TO THE THESIS

1.1 Introduction

This case study is an investigation of an in-service training programme to support the use of Information and Communication Technology (ICT) in Greek public secondary schools. Methods used include documents reviews, questionnaires, interviews and observation. Findings are reported in the context of theoretical background relating to successful change and innovation, effective teaching/learning and professional development, and, especially, effective ICT in-service training. Practical recommendations are made which contribute to the design and provision of an ICT in-service training. These recommendations may be applied by others striving to integrate ICT in their educational context. It is worth clarifying that 'ICT' is used in this thesis when technology is seen as connected to cross-curriculum needs, while 'IT' (Information Technology) is used when technology is seen as a subject and basic skills.

1.2 Overview of the Thesis

After referring to the origin and the aim of the research topic, and having defined the objectives, the key questions, and the importance of the research, the thesis describes the Greek educational system (Chapter 1) in detail. The aspects of the Greek educational system that need to be highlighted are the general administration and responsibilities, the introduction of IT and ICT, pre-service teacher training, and the method of appointment of

teachers to schools. In that way the context in which the training took place will be explained.

Chapter 2 explores the relevant literature. The areas of investigation are: theories of educational change and reform; the forms of changes and the process of effective change; the stance of researchers towards the introduction of ICT in the classroom and its use in the classroom including the barriers to teachers' use of ICT; the role of the teacher in the implementation of ICT; and the role of pre- and in-service training in ICT. This wide review helps to present a deeper understanding of the topic under investigation, leading to the definition of effective ICT in-service training and eventually to the construction of the required research tools.

The next step deepens the research methodology (Chapter 3) by detailing the most appropriate methods and tools to address the research questions. The thesis explores the theoretical background of qualitative and quantitative research and compares the available methods and tools. Having chosen the methods and the tools that were to be employed (questionnaires, interview schedules, observation sheets), I felt the need to construct and test these tools in a pilot study.

The method of analysis had to be assessed (Chapter 4). Before collecting the data, I thought it useful to know how data would be analysed; what theoretical propositions, if any, might underlie the approach and, how the data could be coded; how the qualitative and quantitative methods should be combined and how the report of the research should be

presented. In this way the collection of data became an easier and systematic process and the analysis more straightforward.

The presentation of data is covered in Chapters 5, 6, 7, 8. Data are evaluated on the basis of interviewee job function: teachers; head-teachers; teacher-trainers and program designers. Chapter 9 covers the analysis of data, generated from the research questions set out in Chapter 1. A matrix table is used along with a concept map, in order to highlight the causal relationships among the dominant perspectives of the participants. Finally a comparison with the literature (Chapter 10) and some final remarks are made (Chapter 11). The findings of the research present an example of training with very little impact on teachers' practice, offering at the same time a mirror of how to plan and implement one properly. There were deficiencies throughout all the phases of the training: the planning of the programme, the planning of the sessions, the carrying out of the programme and its evaluation. The particular educational context and teacher status were found to be further crucial barriers to the implementation of ICT.

1.3 The Origin of the Proposal for this Research

Before setting out the research, I set out my interest in the topic. My nationality is Greek and my first degree is in Classics (University of Athens). The decision to undertake this research was taken four years ago, while I was a MA student in the University Warwick. I was always attracted to education and psychology more than to Classics; therefore I came to UK for my MA in Educational Studies. The fascinating experience of seeing the benefits

of ICT use in teaching and learning which I gained from my visits to English schools. during my MA course, were crucial in my decision to look into teachers' ICT in-service training. More specifically, the major reason, which led me to conduct the present research is my awareness of the decision of the Greek Ministry of Education to promote the use of ICT in secondary education, which culminated in the Endoscholiki Epimorfosi (EE) ICT in-service training programme. This led to the planning and the execution of the first ICT in-service training programmes in Greece with the aim of covering the needs of the whole population of Greek teachers. I wanted to look at this issue in a wider context. I have a European perspective on education and I wanted to investigate the rich experience existing in other European countries on this topic and relevant studies that emphasised the importance of teacher ICT in-service training as a factor, which could contribute to successful ICT implementation. The findings of research carried out in Greece and elsewhere, especially in United Kingdom (UK), showed up the need for the training programme designers to reform the ICT in-service training provided.

1.4 The Aim of the Research

This research describes an ICT in-service training (EE) provided to Greek secondary education teachers, the way this innovation was planned and implemented, and evaluates its effectiveness and impact at a personal and school level. It investigates the stance the teachers involved took towards the training, and explores the ways and reasons why ICT was, or was not, implemented into their everyday school teaching activities. It explores the attitudes of teachers, head-teachers, teacher-trainers (those teachers who attended post-

graduate training in order to train teachers in ICT) and policy-makers towards the training process, the development of relationships and teachers' conceptions of ICT in general and of the specific ICT training which they received.

These general aims suggest more specific questions that must be answered during the study:

1. What type of the innovation was planned and introduced and by whom?

- Who planned the programme?
- Was it a centralised or decentralised initiative?

2. What were the important characteristics of the EE training, according to perspectives of teachers, head-teachers, teacher-trainers and programme-designers regarding delivery, structure and content?

- Did the training have an impact on teachers' practice?
- Which aspects of the training were most valued by the teachers?
- Which aspects of the training were least valued by the teachers?
- To what extent did head-teachers support teachers?
- To what extent were teacher-trainers adequately prepared for their role?

3. What problems emerged during the preparation and delivery of the programme?

- How did designers and teacher-trainers take into account the existence of two programmes?

- Was the school environment appropriate for the school based part of the training?
- Was there appropriate infrastructure and technical support?
- Were there opportunities for hands-on work and lesson observations?

4. What prevented or helped teachers to use ICT in their teaching?

- Were the teachers provided with enough time to plan and implement the use of ICT?
- Could teachers fit their use of ICT into the existing curriculum?
- Were teachers supported and pressured to use ICT?

1.5 The Structure of the Greek Educational System

Each national educational system promotes different rationales and employs different implementation strategies suited to their own particular needs (Vavouraki, 2004). Therefore, in order to understand and evaluate the use of new technologies in an educational system, a thorough knowledge of the structure of the educational system itself is required. That is why the administration and responsibilities of the Greek educational system as well as the role of ICT in the Greek educational system are presented.

1.5.1 Administration and Responsibilities

The Greek educational system, in spite of a recent process of profound structuring and reform, continues to be a centralised system and remains unchanged in its main bureaucratic and hierarchical traits (Zambeta, 2002). It is governed by national laws, voted

on by the National Parliament, and by executive acts, decrees and ministerial decisions. These laws affect the organisation of educational institutions, the content of the curriculum and the timetable of schools, the organisation of national examinations, teachers training and so on.

At the top of the educational hierarchy is the Ministry of Education and Religious Affairs (YPEPTH), which forms and conducts the administration of primary and secondary education and is responsible for the implementation of all laws, decrees and directives. The Ministry of Education aided by two educational bodies: the Pedagogical Institute (PI), a supreme instructional educational body and the Educational Research Centre (ERC), an organ that aims to identify the educational needs of teachers in primary and secondary schools and to help them meet these needs by providing resources and support.

The Minister of Education directs the Heads of Directorates of Education (Prefectures) who administer both the public and private schools of their district. Under the direction of the Heads of Directorate of Education are the Heads of Education Offices, placed in prefectures with many provinces or with many schools. The hierarchy continues with the Principal, the Vice-Principal and the Teacher Associations who administer each school unit. The Ministry of Education and Religious Affairs assigns duties to them and demands their fulfillment (Educational Research Centre, 2002). In 2002, the Regional Education Directorates, a new educational institution was established (Law 2986/2002) to coordinate the function of the Directorates of Education and of the Education Offices.

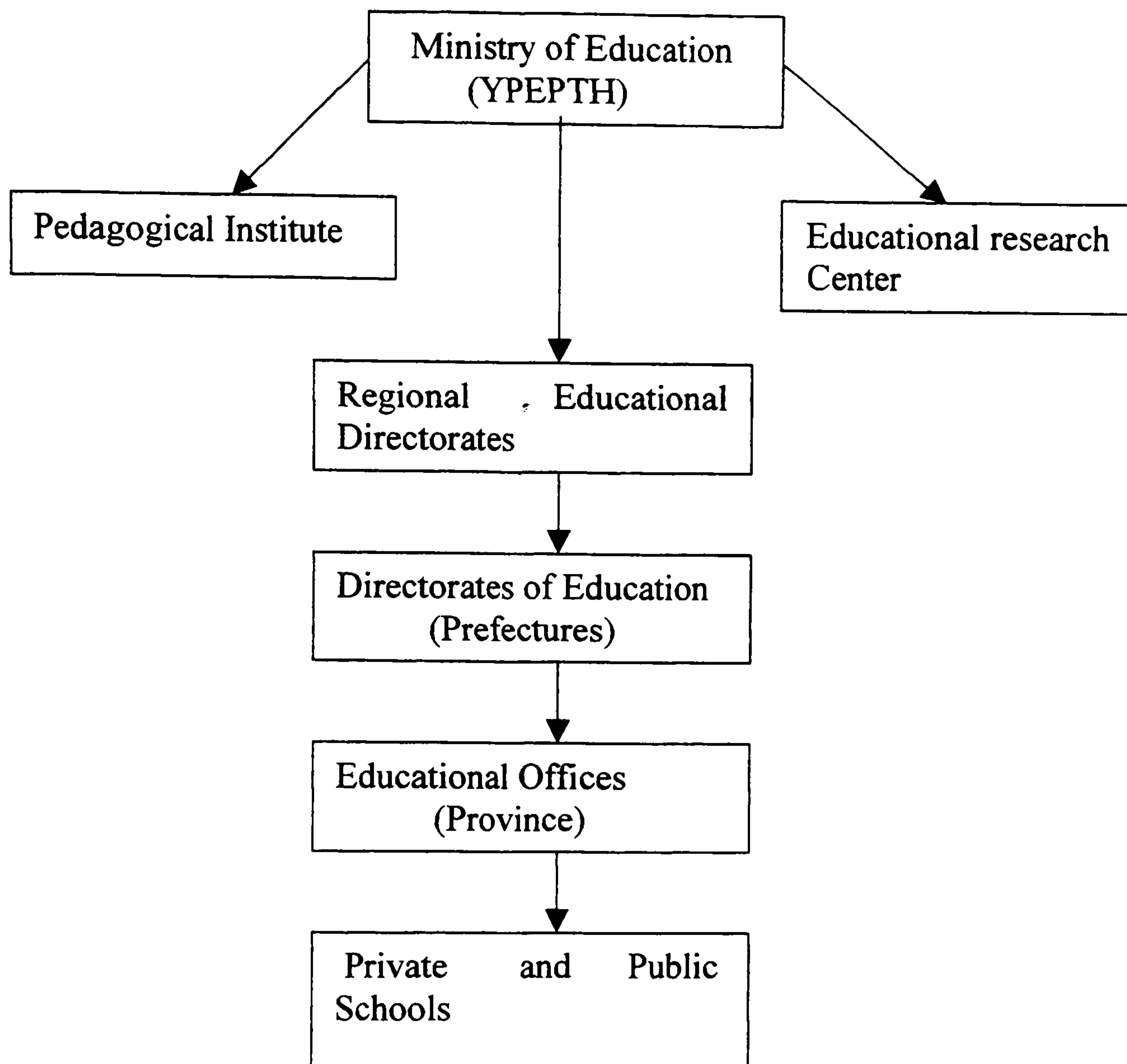


Figure 1.1: The broad structure of the Educational system (source: Educational research Centre, 2002)

Greek general education consists of two levels: Primary and Secondary. Secondary education caters for children of 12 to 18 years old and is divided into two levels: Gymnasium and Lyceum. Pupils proceed from the primary school to the Gymnasium and from the Gymnasium to one of the two kinds of Lyceum, the Unified Lyceum and the Technical Vocational Lyceum, without examinations, on precondition that they have the certificate of graduation from each level. Students who have graduated from the Lyceum may register for one of the Public Universities or Technical Colleges provided that they

have succeeded in examinations conducted by the Ministry of Education on a pan-Hellenic level (Drennoyianni, 2004).

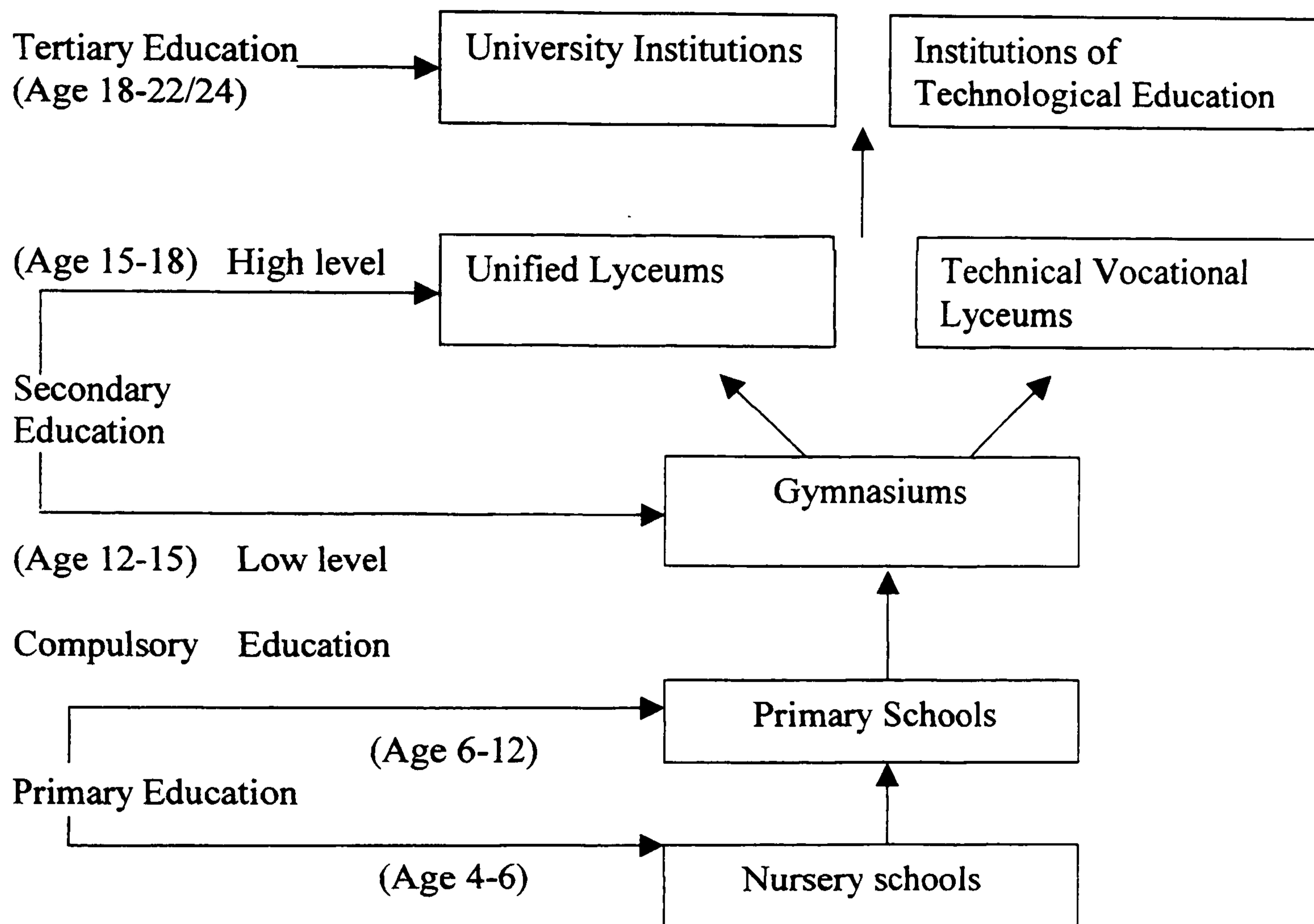


Figure 1.2: The levels of education (source: Educational Research Centre, 2002)

The aims and the content of each subject taught in schools are described in the National Curriculum and are materialised through the use of the textbooks accompanied by teachers directives, written under the supervision of the Pedagogical Institute (PI) and distributed free of charge. Kynigos *et al.* (2002, pp. 192-193) notes that, as happens with systemic and social structures in education in general (Hoyles, 1993); the Greek educational system is conservative and actually hinders teachers and pupils from creative initiatives. It imposes

on students, teachers, and school administrators prescribed curriculum, resources and assessment and has a negative impact on any attempts made to introduce innovation or change.

The Greek school's timetable ranges from 35 hours (low level secondary schools) to 31-33 hours per week (high level secondary schools) (Ministerial Decree A2/6953/1997). According to the Law 1566/85, Greek teachers' work hours gradually decrease as their duration of public service increases. Teachers who have not completed six years in public service teach twenty-one hours per week, teachers with six to twelve years teach nineteen hours per week, while teachers who have completed twelve years of public service have to teach eighteen hours per week.

Although the same law defines that teachers have to stay at school six hours per day (8am-2pm) for school development, most leave the school after finishing their teaching on the grounds that they have to prepare lessons for their next day and that their school does not provide the necessary facilities. This loose legislative framework and the weak authority of head-teachers enable teachers to do this.

1.5.2 IT in the Greek Education System

In recent years a large number of schools in Greece participated in educational programmes mostly funded by the European Union (EU). One such initiative concerns ICT, which has recently been introduced as a teaching tool. Initiatives have followed the traditional top-down process, where decisions are taken centrally by the Ministry of

Education, advised by specially appointed committees (Vavouraki, 2004). Although these committees were planned as an opportunity to reform and improve the educational process, it seems that they have not yet produced the expected results (Vosniadou and Ioannides, 2002).

I. The introduction of IT as a separate subject in the National Curriculum

In Greece until 1985 computers and IT in general had not been introduced into primary and secondary education. The institutional framework for education, as appears in the introductory report of the Act of Parliament 'The Structure and the Function of Primary and Secondary Education' (Law 1566/86) identifies the main traits of the Greek education system and states that the main aim of primary and secondary education is the preparation of pupils to live in the continuingly changing conditions that the scientific-technological revolution creates.

During the 1980s government officials and education experts were convinced that computer literacy or informatics should become an integral part of modern education (Maritsas *et al.*, 1992). In response to this challenge the Greek Ministry of Education introduced computer literacy as an independent compulsory course at the second grade of Unified Lyceum in 1985 and at the same time decided to implement computer literacy courses in all lower secondary general schools (i.e. introduction to computer concepts and basic skills) (Makrakis, 1997, Komis, 2004, pp. 42-43). It was believed that it would be technically and educationally quite complex to carry out the parallel introduction of the ICT use for educational purposes in schools (Vavouraki, 2004). The introduction and

implementation of IT in education in Greece reflected a theoretical and techno-centric stance to computer literacy instruction (Makrakis, 1997, Maritsas, 1993).

II. The introduction of computers in schools as a tool

The implementation of IT in the secondary education National Curriculum did not then have any effect on subject teaching and learning (Kontogiannopouou-Polydorides, 1996). The first suggestion for implementing ICT as a tool in schools was made in 1992 (Maritsas *et al.*, 1992). In fact, for the first time a Unified Framework Studies Programme (UFSP) was planned and completed at the end of 1997 and it was institutionalised in 1998. According to Vavouraki (2004) two main factors in the mid-1990s changed the pattern of implementation of ICT in Greek schools: first the need to modernise teaching and learning in Greek schools and the belief that this could be done by using ICT; and second, funds from the European Union (Second European Community Support Framework) and the responsibilities arising from that. This programme was slightly changed in 2001-2003 (FEK 1376/18-10-2001), without losing its basic philosophy, orientation and content. Policies were introduced to address the challenge of the implementation of ICT in all levels of Greek education and affect aspects such as, for example, the curriculum, the teaching methods, the specifications of the relevant textbooks and the construction of computer suites.

Three training programmes of different types were designed and implemented:

(i) The 'Odysseia' - Hellenic Schools in the Information Society Programme

The 'Odysseia' Project, which could be characterised as an 'integrated' long-term programme (Kontogiannopoulou-Polydorides, 1996), was launched by the Ministry of Education in 1996 (Kynigos, 2002, p.33) and lasted until 2001 (Vavouraki, 2004). This project was designed by the Academic Research Institute on Computer Technology, an independent academic research and development Institute founded in 1985 in Patras. It was supervised by the Ministry of National Education, in cooperation with the appropriate departments of the Ministry of Education, more specifically the Directorate for Secondary Education Studies, Directorate for Community Support Framework and the Pedagogical Institute. It was intended to cover 10% of the total number of schools all over Greece (Kynigos, 2003).

The 'Odysseia' project mainly aimed to develop the necessary 'critical mass' of school communities that would integrate technologies as an everyday tool, encourage exploratory and collaborative learning, develop the communication skills of pupils and provide valuable experience for further diffusion. This project sought to develop appropriate educational material and to organise school computer suites for teaching purposes, and tried to realise its goals in two basic ways:

- By providing training and necessary support for teachers of all subjects during school hours by ICT trained teachers;
- By training teacher-trainers and organising school-based in-service teacher education (Polites *et al.*, 2000, Vosniadou and Ioannides, 2002).

It is worth noting that neither of the above had been initiated earlier except the equipping of schools with computer suites for the teaching of IT.

At the beginning of the project (September 1999), it was announced that there was need for 15 teachers of various specialisms to volunteer to participate in the project and become teacher-trainers. Selection would be based on the length of teaching experience, sensitivity towards the contribution of ICT to teaching, and a positive stance towards implementing computers into school teaching and learning practice. The following year 90 more teachers were added. They were trained at post-graduate level for one year in three training centres overseen by three Universities, the National and Kapodistrian University of Athens, the Aristotelian University of Thessaloniki and the University of Macedonia. These were independent in carrying out the relevant programme. The Committee responsible for the selection of trainers downgraded the criteria during the second year (2000-2001) in order to cover the training needs of areas in which recruitment was difficult.

The main aim of the training was to enable these teachers to educate colleagues in the use of ICT for teaching and learning in their respective specialisms. The whole training programme was organised on two levels: (i) on a theoretical level, taking place in the University and (ii) on a practical level, taking place in the schools for which they were responsible. On that level the future teacher-trainers were obliged to follow 'horizontal' training, that is to all teachers irrespective of specialism, and 'vertical' training, that is to the teachers' of the same specialism (Kynigos, 2002, p. 40-42). During the years 1999-

2000 and 2000-2001 105 teacher-trainers in total had completed the post-graduate courses specifically designed to educate teachers in the use of ICT in schools.

After completing their course these 105 teachers were relieved of their school duties and were given the task of engaging in in-service education programmes (Kontakides and Kaskandami, 2004). They were responsible for training 5,500 teachers and for introducing ICT to the teachers of the school in which they taught as well as to the teachers of three or four neighbouring schools. This programme operated at two levels. The first covered the introductory concepts of computer science and some basic issues relevant to the handling of computer (horizontal), while the second, was expected to give teachers of the same specialism, the necessary ability to incorporate ICT into teaching as a catalyst for the reconstruction of education (vertical). To achieve this purpose the training provided covered the following topics (Kynigos, 2003, p. 263-264):

- The educational value of ICTs;
- ICT teaching methodology;
- Technical training in the use of educational;
- Methods for teaching classes in the 'Odysseia' ICT computer suites.

During the 'Odysseia' project educational software had been created, in order to be used in the training and later by the teachers. In addition, an educational website www.e-yliko.gr had been organised in which the teacher-trainers published suggestions for lessons with ICT to provide additional help.

Hatzilakos *et al.* (2001) and Kynigos (2003) refer to some considerable difficulties, which arose during the implementation of project 'Odysseia', namely:

- The administration and management, including the considerable workload involved in the attempt to coordinate a variety of specialisms;
- The need to recognise and institutionalise the teacher-trainer and the technical assistant roles;
- The complex character of the project activity;
- The failure of administration to recognise its importance;
- The difficulty of infusion in the classroom and the 'messy' nature of classroom applications.

(ii) The 'Preparing Teachers of the Information Society Programme'

Responding to the challenges created by the 'Odysseia' programme the Greek Ministry of Education invested a total of 100 million ECUs over a three year period (2000-2003) and gave the Pedagogical Institute (PI) the task to plan and implement a project, the largest and most comprehensive in the Greek education, entitled 'Preparing Teachers for the Information Society' (YPEPTh, 2000). This programme started in January 2001, was carried out in Training Support Centres (TSC) and was expected to fulfill its aims by the end of 2003, which were to provide 75,000 teachers all over Greece with ICT in-service training.

This training programme was structured on three levels. However, only Level 1 (P1) was put in practice. From the brief description of activity included in the 5572/28-11-2000 circular of the Pedagogical Institute appears that teachers were asked to participate in:

Level One (P1): Training in generic ICT skills (48 hours).

Level Two (P2): Training in the use of ICT in subject teaching and its integration in educational practice (24 hours).

Level Three (P3): Design and production of educational activities, lesson plans and scenarios related to the ICT exploitation in classroom (40 hours).

According to the programme's aims by the end of the training teachers should know when, how and why ICT could and should be used in the teaching and learning process; how to choose, organise and use resources provided by the ICT in order to design and prepare effective and productive teaching (Papadopoulos *et al.*, 2001).

This project was designed to be decentralised. In-service training was being organised at a local level, with decisions over the time of training, the methods employed and the provider used being made by the schools. The project's framework though had been determined by the Pedagogical Institute (PI), which produced the educational material and the training curriculum for all training programmes (Papadopoulos *et al.*, 2001, Drenoyianni, 2002, p.549; YPEPTh, 2000). Participating teachers were to be given a certificate for attending the programme, while those who wished could take part in special examinations related to the skills acquired during the Level I of the programme in order to

take a 'Certificate of Successful Attendance'. The results of the programme were to be evaluated on the basis mostly of the skills acquired by the teachers (YPEPTh, 2000). In addition, teachers were granted free ISDN Internet connection.

(iii) The 'In-school Training in ICT' Programme'

From the academic year 2001-2002 the 'Odysseia' training programme passed into the responsibility of the Ministry of Education and another programme, known as 'Endoscholiki Epimorfosi' (EE), started operating with some striking differences from the 'Odysseia' Project. Kontakides and Kaskandami (2004, p.1) noted:

At the centre of the whole attempt is the trained teacher-trainer, who, through the training, acquires characteristics which define him, not only when he teaches his students at the computer laboratory, but in all aspects of school life.

In fact the teacher-trainers had been charged with the responsibility of providing training only to the teachers of the same specialism as themselves in their own school and other neighbouring schools. Each teacher-trainer, after identifying the special needs of teachers and their willingness to participate in this ICT in-service training, formed three groups consisting of 10-12 teachers.

The training meetings were held in ICT computer suites of the schools, once per week, outside school hours and lasted three hours. These suites were provided by the Information Society Project of the Ministry of Education. The content of these meetings was defined by a special Committee of the Ministry of Education within the Framework of ICT Training Programme (Dapontes and Kontakides, 2001, Kontakides and Kaskandami, 2004).

Teachers trained by certified teacher-trainers were expected to learn to use ICT in teaching units from the official textbooks of their subject. They were also obliged to organise two sessions in the computer suites of their schools for their pupils and with the assistance of their teacher-trainer in order to acquire a 'Certificate of Successful Attendance' (Kontakides and Kaskandami, 2004). The participants finishing their training course were to be given a certificate after taking part in examinations, which would take place separately in computer suites specially set aside for this purpose in Greek Universities and Technical Institutions (Vosniadou and Ioannides, 2002). This programme was completed by the end of 2003 and for the time being is not being continued. The lack of necessary funds and the political change that took place in Greece in 2004 interrupted the continuation of the programme.

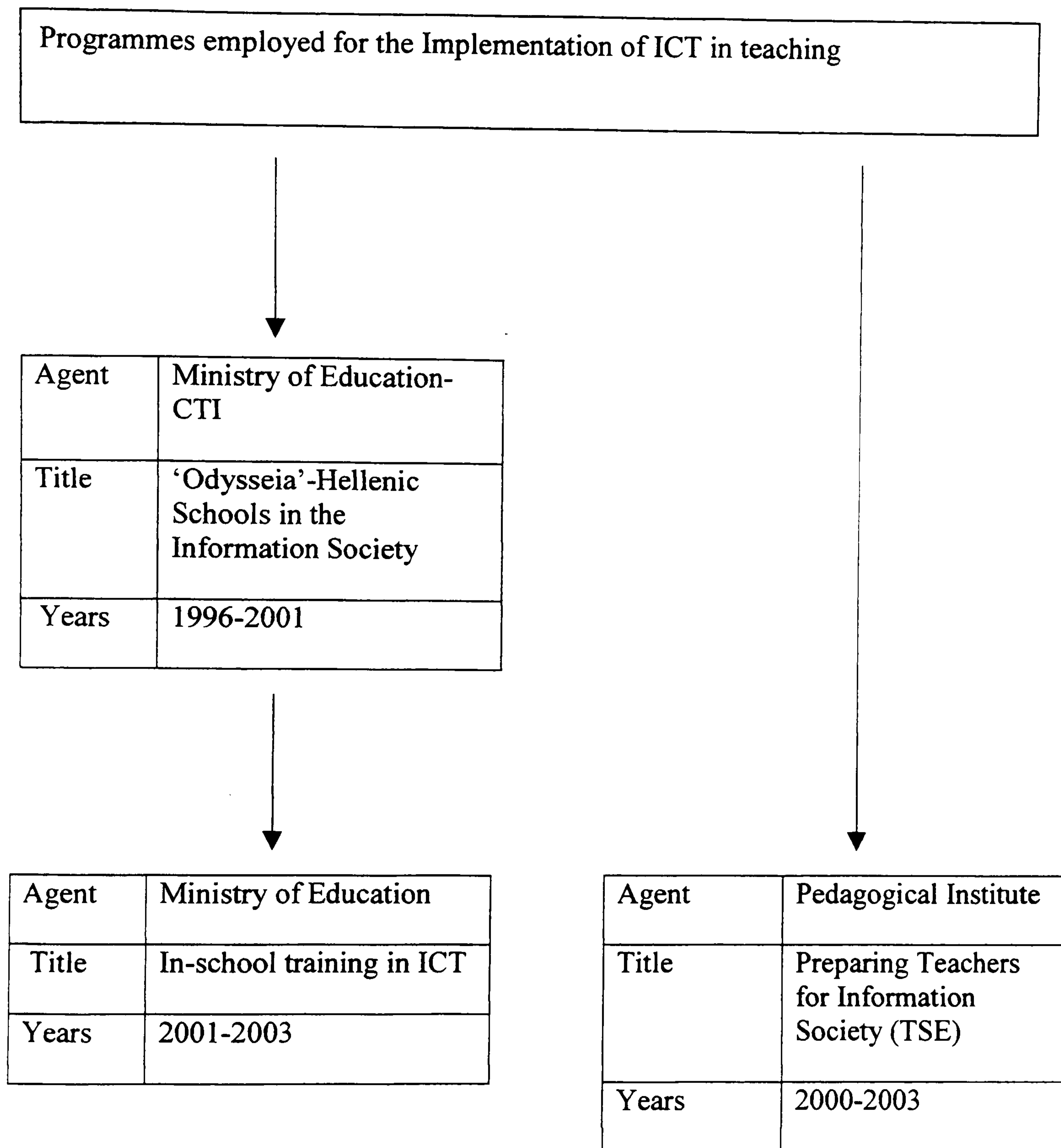


Figure 1.3: Programmes employed for the Implementation of ICT in teaching.

1.5.3. The Evaluation of these Training Schemes

There was not an official evaluation of the EE programme. Small-scale research was conducted in Greece by several interested academics and teacher-trainers who found that:

- There were unclear conceptions about the teachers' role in promoting ICT within schools and the lack of a framework for the introduction of ICT in the curriculum made the integration of ICT in schools and its use for educational purposes difficult (Kynigos, 2001);
- A strong school policy for the integration of ICT and a positive school culture and a general positive climate expressed by mutual support and collaboration was a key factor that could promote the diffusion of ICT into school (Svolopoulos *et al.*, 2002; Vavouraki, 2004);
- The educational software provided, although serving some educational aims, was judged to be very limited in quantity and poor in quality and variety (Kynigos, 2001; Vosniadou and Kollias, 2001; Svolopoulos *et al.*, 2002);
- The existing computer suites in schools and the relevant facilities available were quite limited (Vosniadou and Kollias, 2001);
- Time constraints prevented teachers from integrating ICT into their teaching (Vosniadou and Kollias, 2001);
- ICT training was not long enough (Kynigos *et al.* 2001, Vosniadou and Kollias, 2001);
- There were problems related to ICT implementation and use in the classroom and ICT integration within the current National Curriculum; the duration of teachers' involvement with the project as well as the duration of teachers' training was

reflected in the level of ICT implementation (Svolopoulos *et al.*, 2002; Hatzilakos *et al.*, 2001);

- For the effective use of ICT continuous technical and professional support and encouragement from in-school and out of school factors is necessary (Svolopoulos *et al.*, 2002), but was insufficient with the programmes (Kynigos *et al.*, 2001; Vosniadou and Kollias, 2001);
- This small-scale use of ICT in teaching created a positive learning environment (Kynigos, 2001), but teachers rarely made use of the software available for their everyday teaching (Svolopoulos *et al.*, 2002);
- The focus of Lyceum pupils' efforts on preparation for entry examinations to the Universities lessens their motivation to attend lessons performed with the use of ICT (Educational Research Center, 2000; Vosniadou and Kollias, 2001).

1.5.4. The Provision of ICT in Greek Universities

The provision of ICT in Greek Universities seems to be insufficient and mainly skills oriented. No coordination exists between the Universities that prepare teachers and Greek schools as regards ICT. Student-teachers do not gain ICT competence from their University studies; they are not ready to implement ICT during their school placement and to adopt new technologies in their teaching. They do not participate in ICT training during the first year of their teaching career in order to be capable of integrating ICT in teaching and learning. The content of computer courses offered at Universities does not match the student teachers professional needs and expectations, since the machines used are not updated. Furthermore, the instruction is given from a technical or computer science perspective and the instructors who usually teach these courses come mostly from the field

of computer sciences and lack pedagogical or educational experience (Makrakis, 1997; Drossos, 1998; Drenoyianni, 2004).

From 1998 an independent body called Supreme Committee of Personnel Selection (SCPS) started conducting Pan-Hellenic examinations every second year in which all those who have graduated from Greek Universities have the right to participate. These examinations assess the general and specific scientific and pedagogical knowledge of the candidates in three subjects relevant to their specialism. For example, candidates graduating from the Department of Classical Philology are obliged to be examined in Educational material plus three subjects relevant to their specialism, namely Ancient Greek, Modern Greek and History. This process shows that ICT knowledge is underestimated and ICT skills are not taken under consideration for teachers' selection and appointment.

1.6 The Importance of the Research

This study of EE will be useful from many aspects. It will enrich the literature adding to the ideas and findings of previous research into ICT training for teachers and curriculum reform. It will also give an exemplar of ICT teachers' training and educational change from a country with a centralised educational system with striking school culture peculiarities and will show whether commonly accepted theories on ICT implementation can be applied to other cultural environments. It will help programme designers to make necessary changes and modifications to teacher training projects. The research will also be

valuable to teachers as reform agents, because it will help them to identify their real training needs and contribute to their professional development that will lead to school improvement. Finally, the research will be important to the Greek education reformers providing them with guidelines for appropriate ICT teacher training, helping them to plan ICT innovation successfully.

1.7 Chapter Summary

In this chapter, the aims of the research and its context have been defined and an overview of the thesis provided. The background of the Greek educational system was highlighted and the reasons for undertaking the research were explained. As a final part of the introduction, the importance of the research was discussed. The following chapter examines theories of educational change and reform, forms of change and the process of effective change. It also examines the introduction of ICT in the classroom, the barriers to ICT use, the role of the teacher in the implementation of ICT and the role of pre- and in-service training in ICT.

CHAPTER 2: LITERATURE

2.1 Introduction

This chapter sets the case study in a wider context by reviewing the literature related to theories of educational change and reform, the introduction of ICT in the classroom, the barriers to ICT use, deepening into the role of the teacher in the implementation of ICT in their teaching and the role of pre- and in-service training in ICT. This review is aiming at a definition of the characteristics of an effective ICT in-service training programme and gives a basis of comparison when analysing the findings from this study.

The chapter starts from more general aspects such as the process of effective educational change and reform. It continues with research on the introduction of ICT and its use in the classroom including teachers' conceptions about the potential of ICT and the factors that prevent teachers from using ICT in the classroom. Then it focuses on teachers as the key factor for implementation of ICT in the classroom and the pre- and in-service training of teachers as factor promoting ICT integration in classroom. Finally it summarises the characteristics of an effective ICT in-service training programme.

2.2 Literature relevant to Educational Change and Reform

The introduction of computers into school aims to change radically traditional styles of teaching and learning. It imposes new roles on schools and teachers but it must be embedded in appropriate ways. Guskey and Sparks (1996) suggest that a good idea

implemented poorly seldom brings positive results. Therefore it is necessary to study international experience and philosophy of successful implementation of educational reform.

2.2.1 Types of Change

Changes that are introduced in the educational context are of various kinds (Hopkins *et al.*, 1996, p. 2; Fullan, 2000). Some are imposed by governments, especially in countries with a centralised educational system such as Greece, and are called 'top-down' approaches. These approaches are concerned with outcomes rather than processes and may tend to treat teachers as part of the problem rather than part of the solution. There are also initiatives and interventions that are voluntary or bottom-up and self-imposed by the school. These may have more chance of succeeding, because these are less likely to incur resistance and sabotage, and tend to make teachers feel less pressurised or frustrated (Harris, 2002, p. 6, 37).

Research shows that educational projects that have been effective in one country may be ineffective in another and that better educational systems are those that meet the particular needs of the teachers and the pupils of each school (Stoll *et al.*, 2000, p.1; Hopkins, 2001, p.3). This is due to the differences that exist between educational systems and perhaps to the degree of decentralisation or centralisation.

Research evidence also points out that there is no 'universal panacea' or 'blueprint' for school improvement and that there is no universal starting point for any school. Each

individual school has its own context, history, leadership, staffing, incentives and, in general, its own 'ethos' (Harris, 2002, p. 11). The so-called 'one size fits all' approach substantially misinterprets the process of change at both school and classroom level (Stoll and Myers, 1998). Hopkins (2001, p.2) observes that there are not simple and rapid solutions to complex challenges and as Harris (2002) suggests:

the key to school improvement lies in selecting the programme or approach that matches the developmental needs or priorities of the school.

(p. 28)

Hopkins *et al.* (1994) distinguish two kinds of school improvement projects: (i) the organic, which suggests broad principles, or general strategies within which schools are likely to develop and improve and (ii) the mechanistic, which provides direct guidelines and prescribe specific strategies and activities. Organic projects have proved to be highly effective, because these match the particular developmental needs of the school.

2.2.2 The Process of Effective Change and Reform

All stakeholders in managing a change process must be familiar with the phases of change and be able to anticipate the possible responses from others prior to introducing the change (Harris, 2002). Much of the literature agrees that any process of effective educational change or innovation passes through three stages (Fullan, 1991; Mitchell and Sackney, 2000; Harris, 2002; Goldstein and Ford, 2002): the starting or initiation stage, during which schools commence work for their improvement; the securing or implementation stage, during which schools put their improvement plans into action; the sustaining or

institutionalisation stage, during which the practice of school improvement becomes an integral part of school development.

I. Starting or initiation change

This phase refers to the planning and the introduction of change. Research evidence demonstrates the importance of matching school improvement approach and strategy to school type, the 'fit' between programme and the developmental needs of the particular school (Williams, 1991; Steadman *et al.*, 1995; Craft, 1996) and the anticipation of teacher responses.

A diagnosis of the developmental needs of teachers helps to identify the most appropriate techniques and strategies for change (Hopkins *et al.*, 1997; Hopkins *et al.*, 2000; Hopkins 2001; Harris, 2002). Williams (1991) notes that

the identification of INSET needs is neither a cosmetic activity nor something that can be undertaken in a mechanical way. If it is done badly, then the provision of INSET and the evaluation of its effects will also be less efficient and worthwhile.

(p. 113)

In the context of ICT Passey and Ridgway (1992) say that, because of teacher population being diverse regarding their IT needs, and school environments are differentiated too, some preliminary work should be done in terms of devising appropriate provision and that, if participants' specific needs and demands are not assessed, the impact of the change process cannot be evaluated. Goldstein and Ford (2002, p. 83) too emphasise the importance of the needs assessment saying that it 'provides all the critical input for both

the design of the training environment and the evaluation of the actual training programme’.

Teachers’ response to change need to be anticipated in order to manage change successfully (Gray and Wilcox, 1995). Responses range from passive, ambivalent acceptance to wholehearted, enthusiastic support. Sikes (1993, p. 45) further notes that teacher responses to an imposed change could vary from ‘carrying on as before’ and general ‘resistance and sabotage’ to ‘grasping the opportunity’.

Fullan (1991) has identified two main barriers that affect the initiation phase of change, first lack of access to relevant information about the change itself and second the pressure on teachers and the demands made on their time. Research shows that when teachers are well informed about proposed changes and are given the opportunity to share in the decision-making process, especially when the changes are to influence their work, they are more likely to adopt and support these changes (Fullan, 1991; Hargreaves, 1994). A policy for the introduction of ICT in education must be grounded on a new vision of ‘ownership’ of innovation, on a sense that teachers are not passive receivers but active co-learners (O’Donnell, 1996; Vivancos, 1997; Ogborn, 2002). It is observed that the way in which change is presented to others is critically important, because it determines the degree of resistance or support that will ensue (Harris, 2002, p. 37).

II. Securing or implementation phase

During this phase the planned change or innovation is put into practice. Planning stops and action begins. Research evidence shows that schools spend a lot of time and attention to planning the innovation intended with little emphasis upon action. That is why at this stage some innovations may flounder, lose momentum, and ‘implementation dip’ may occur (Fullan, 2001, p. 40), that is a general feeling that the change is making little or no progress at all and so additional effort is required to mobilise it (Harris, 2002, p. 43; Joyce and Showers, 2002). Some factors that seem to play an important role in the successful implementation of any change or reform are:

(i) Understanding the meaning of change itself.

Nias (1989) highlights the importance of teachers’ beliefs and values for the implementation of any reform noting that:

Modifications in professional practice often require individuals to alter deep-rooted, self defining attitudes, values and beliefs; the personal redefinition which it involves is likely to be slow, stressful and sometimes traumatic.

(p. 62)

Nias (1989, p.41) stresses the individuality of the meaning of change saying that ‘much depends on what the change means for teachers’ ideologies and philosophies, for the kind of teachers they want to be and be seen as being ...’, while Stoll and Fink (1996, p. 45) note that ‘there is not only one version of what...change should be...Change is a personal

experience'. That is why clarity about the purposes of the change is essential for the successful integration of an innovation (Harris, 2002, p. 42).

(ii) Exercising pressure and providing support.

Fullan (2000, p. 41) reviewing three types of large-scale reform suggests that integrating pressure and support is a factor that could contribute not only to the establishing of a large-scale reform, but also to sustaining it. Guskey (2002) too maintains that support allows those involved in the difficult process of implementation to tolerate anxiety of failure and pressure on the other is often necessary to initiate change among those whose self-impetus for change is not great and provides the necessary encouragement and motivation to persist. An appropriate mix and balance of pressure and support is also supported by Harris (2002, p. 43).

(iii) Providing the appropriate time.

A crucial factor for the effective management of an innovation is appropriate time. Change at the school level is neither easy nor fast. Researchers maintain that there are no 'quick-fixes' to the challenge of improving school performance (Stoll and Myers, 1998; Hopkins, 2001, p. 2), which reinforces the message that effective school improvement cannot be a 'bolt on' activity; it is not a single approach but a powerful set of processes. Harris (2002, p. 40, 45) agrees that without adequate time implementation is likely to flounder and fail. On this point Day (1999) adds that, while changes and innovations introduced in education burden teachers with more obligations, governments do not allow appropriate time for

teachers to meet with one another and discuss new ideas (Day, 1999). Evidence suggests that changes that are introduced quickly and without the necessary time for proper implementation are likely to fail. Even small-scale changes need time and require careful attention to be paid to the phases of change (Leithwood *et al.*, 2002).

(iv) School working as learning community and community of practice

Educational change or innovation is best achieved when schools improve teachers' capacity (Hopkins *et al.* 1994), but it is observed that 'continuous capacity building... is best done within communities of practice' (Sergiovanni, 2000, p. 140). In a professional community there are shared norms and values among teachers and students (Barth, 1990). Teachers participate in decision making and setting aims and objectives, work in a collaborative way, and have a shared sense of responsibility for the results of their work (Sergiovanni, 2000). Teachers are active in constructing meaning and collaborating in mutual inquiry and learning (Mitchell and Sackney, 2000).

Improvement is widely accepted by researchers (Clarke, 2002; Kynigos, 2003). It is acknowledged that a powerful form of teacher learning comes from belonging to professional communities (Brown and Duguid, 1991; Talbert and McLaughlin, 1994). Professional learning arises from building partnerships with other teachers and creating greater interactive professionalism among communities of teachers the quality of relations between staff rather than resources or systems enables schools to develop and grow (Fullan and Hargreaves, 1992). Schools with an individualistic culture in which the process of teaching is rarely discussed or evaluated are most likely to fail (Hopkins *et al.*, 1996;

Mitchell and Sackney, 1998). Wenger (1998) and Joyce *et al.* (1999) point out that teachers derive their identity and their understanding of their work from their membership of, and participation in, communities of practice.

Some projects set out to encourage teachers to build their own professional communities inside and outside the school. It seems that schools need to build a climate of collaboration premised upon communication, sharing and working together. As Harris (2002, p. 103) observes 'when teachers are engaged in dialogue with each other about their practice then meaningful reflection and teacher learning occurs'.

In contrast, some researchers describe the difficulties put on collaboration by institutional constraints such as lack of time for genuine reflection and generation of communities of practice (Grossman *et al.*, 2000; Sergiovanni, 2001; Kynigos, 2001). While others (Louis *et al.*, 1996; Harris, 2002) identify a set of preconditions that seem to enable or facilitate the development of a professional learning community. These are:

a. In the area of *human resources*:

- mutual trust and respect;
- access to expertise and supportive leadership;
- shared power;
- socialisation.

b. In the area of *structural support*:

- time and place to meet and talk;
- independent teachers' roles;
- communication structures;
- teachers' empowerment.

(v) Head-teacher performing successfully his role

Policy makers view school leaders as holding the key to resolving a number of problems that schools face. The centrality of leadership to school improvement is acknowledged by researchers (Jackson, 2000; Harris and Bennett, 2001). Sammons *et al.* (1997, p. 199) state that:

Leadership helps to establish a clear and consistent vision for the school which emphasises the prime purposes of the school as teaching and learning and is highly visible to both staff and students.

West *et al.* (2000, p. 36) emphasise the contribution of school leaders to school development and the effectiveness of its staff.

Any successful change or innovation requires direction and leadership and any failure of school improvement is mostly due to inadequate leadership within the school (Harris, 2002, p. 19). Where leadership is too authoritarian or laissez-faire, development is not likely to occur (Harris, 1998). School leaders need to exercise the necessary pressure on

teachers and at the same time help them throughout the 'implementation dip' by offering technical, emotional and physical support (Fullan, 2001, p. 41).

An innovation is more likely to succeed in a school-professional community where leadership is distributed (Barth, 1990; Mithcell and Sackney, 2000). Harris (2002, p. 65) sees leadership as 'about intervention and change; it is not about position or authority' and notes that successful leaders create professional communities and promote the climate for improvement in schools.

(vi) Adopting a school culture supporting reform and change

The school improvement movement has shown that understanding of school culture is very important for the implementation of a change or reform in school. Barth (1990, p. 45) reinforces this idea saying that 'what needs to be improved about schools is their culture, the quality of interpersonal relationships, and the nature and quality of learning experiences'. Leithwood *et al.* (1995) regard culture as the main characteristic of school as a learning organisation and by this term they seem to mean collaborative action, mutual support, sharing ideas and materials and mutual respect.

Research has shown how different types of school culture affect the practicality of school-level change (Stoll and Fink, 1996; Hopkins, 2001), and that is why it is suggested that in order to commence the process of school improvement, it is initially necessary to diagnose the culture of the particular school and then to try to change this culture for the better (Harris, 2002, p.15, 17; Guskey, 2002). Guskey and Sparks (1996) suggest that a proven

innovation may fail if implemented in a context that is inconsistent with its principles or one that does not support change. A school culture that promotes collegiality, trust and collaboration (Mitchell and Sackney, 2000, p. 49; Hopkins, 2000) and balances pressure and social cohesion (Hargreaves, 1992, p. 11) is more likely to succeed in self-renewing, while dysfunctional staff relationships, insufficient focus on teaching and learning and dissonant values that render the school culture fragmented and affect the change process in a negative way (Myers, 1995).

III. Sustaining or institutionalisation phase

A fully secured or implemented change is viewed as an established everyday practice embedded into the culture of the school. While it is quite easy to initiate a change, it is more difficult to sustain it over time (Huberman and Miles, 1984). It does not happen automatically, but requires that the change is monitored and evaluated as to its impact and its results. The typical school evaluation form of review-planning-action is regarded as an essential part of successful development (Goldstein and Ford, 2002, pp. 83-84), because it provides the necessary critical feedback and the information flow needed for reflection upon changes and the modification of practices. Evaluation of change and innovation aims at judging whether and to what degree the change has fulfilled its intentions. Southworth and Conner (1999) suggest that an effective evaluation must be: comprehensive, as regarding the collection of data on the development of change; systematic, as regarding the way the data is collected; objective, as regarding the way it looks at the evidence and

reliable, as regarding the degree in which it substantiates and validates the subsequent judgments.

2.2.3 Teacher Professional Development

All successful school improvement programmes take teachers as the catalyst for classroom change and development and try to engage them in professional dialogue (Harris, 2000). The UK government, recognizing the central role teachers' professional development could play as a way of maximizing the impact of reforms, has increased funding of programmes to enhance the ICT skills of teachers (Harris, 2002, p. 100).

However successful teacher professional development means a departure from the old norms and models of pre-service and in-service training and creates new images of what, when, and how teachers learn. Professional development directs the work of teachers to strategies intending to develop schools' and teachers' capacity to be responsible for students' learning (Darling-Hammond and McLaughlin, 1995) and concentrates on enhancing skills, competency and knowledge and tends to encompass research knowledge, information from outside the school, teacher's personal knowledge and knowledge teachers construct as group (Harris, 2002, p. 99).

Harris (2002, pp. 102-109) identifies some traits or ways, which are identified and analysed by many other researchers (Darling-Hammond, 1990; Hargreaves, 1992; Darling-Hammond and McLaughlin, 1995; Craft, 1996, Guskey, 2000, p. 38), through which this development could be attained. These are:

- Collaboration: this gives teachers the opportunity to work together, to learn from each other; it dispels feelings of isolation and assists in enhancing practices; it enables teachers to implement new ideas into the context of supportive collaborative relationships (Little, 1993; Hopkins *et al.*, 1996);
- Reflection: this helps teachers to concentrate their attention on the reality of classroom practice, to analyze their own and others' teaching and makes them try to improve it (Day, 1993);
- Action enquiry: this is described as 'systematic and sustained enquiry, planned and self-critical which is subjected to public criticism and to empirical tests where these are appropriate' (Stenhouse, 1981, p. 34) and prompts teachers to identify practical problems and issues that inevitably arise from their professional activity, to collect and analyze relevant information, to undertake action and evaluate its impact (Harris and Hopkins, 1999);
- Classroom observation: this is a pivotal activity that helps teachers to learn more about the learning process and their involvement in it (Cooper, 1989) and to link together reflection for the individual teacher and collaborative inquiry for groups of teachers (Day, 1999); it is 'a process by which educators can understand and give meaning to what they see and hear, drawing on their own knowledge and experience' (Drummond *et al.*, 1992, p. 42) and satisfies adult learners' need to be aware of their own and others' perceptions and practices in order to develop fully as professionals (Eraut, 1994); it is regarded as a:

Prime source of professional feedback, necessary for improvement and the opportunity to engender and develop a language about teaching simply through talking to others about what happens in classroom.

(Harris, 2002, p. 57)

Beyond the above, research evidence presents that effective professional development is a sustained, life-long and supported by other factors, both inside and outside school (Darling-Hammond and McLaughlin, 1995; Guskey, 2000, p. 38), which is connected to other aspects of school change (Darling-Hammond and McLaughlin, 1995; Guskey, 2000, p. 38).

Another powerful tool for teachers' professional growth and development, which is worth referring to, is teachers' vision. Although some say that vision can sometimes lead to disappointment (Little, 1996), it also gives meaning to work (Fullan, 1993, p. 13). Pursuing a vision is not only a means to generate commitment, but a fundamentally moral act that characterises a 'good' or 'ethical' teacher (Sockett, 1993, p. 17) and that it could result in a deeply motivating and personally meaningful sense of shared purpose and to provide a powerful force for reform (Greene, 1995).

Hammerness (2001) observes that vision provides teachers with a means not only to develop activities and lessons that feel more consonant with their ideals, but they also serve as a means for reflection, and thus helps the implementation of any reform and innovation. Leithwood *et al.* (2002, p.12) regards vision as 'policy levers', part of comprehensive large-scale initiatives, and argues that for any large-scale reform to be successful, it should be guided by a vision of the outcomes, and that 'such a vision is an important resource for assisting districts and schools to establish and maintain coherent efforts'. Likewise, Harris (2002, p. 30) says that absence of such a vision usually creates confusion, demoralisation and failure.

2.3 Research on the Introduction of ICT and its Use in Classroom

Research concerning the role of computers in education is perhaps not surprisingly varied. From the first, the literature has sometimes moved between two extremes: a kind of technological determinism which sees the use of ICT as contributing to the desirable reform of education (the 'computer dream') and a kind of nightmare in which computers depersonalise teaching and learning or, at the least, use up disproportionate educational resources.

The government through BECTA has sought pragmatic research evidence that 'ICT does contribute to learning outcomes'. The evidence from the Impact reports (1, 2) and the recent Test Bed work (3) has been open to criticism on many accounts but does tentatively suggest that such a link may be made – though it needs to be recognised that in many cases this work is looking at ICT in support of an existing curriculum.

Even those who maintain a positive stance towards the use of ICT are increasingly aware that there are very many factors such as access, training, support which need to be in place if the use of computers are going to contribute to teaching and learning. Nevertheless, almost all researchers dealing with the problem of ICT's impact on teaching and learning recognise the complexity of evaluation. Computers are not an impersonal tool for autonomous learning, but rather a tool which mediates the interaction between teacher and learner. Accordingly, the use of ICT does not necessarily produce learning gains, because

there are many other factors to consider. No definite link exists between ICT use (as cause) and improved pupil's performance (as result) (Rudd, 2001). That means that ICT and computer projects cannot simply be 'bolt on' or 'imported in' to school development or school improvement process (Rudd, 2000).

Rather, there is, arguably, a relationship between the ways in which ICT has been used and pupils' attainment, which suggests that the crucial component in the appropriate selection and use of ICT within education is the teacher and her/his pedagogical approaches (Cox and Webb, 2004, Cox *et al.*, 2003). All these are closely related to teachers pre- and in-service training (Driscoll, 2001). A complicating factor is that computers threaten to be disruptive to existing patterns of classroom organisation and management and provide the teacher an additional role: a change agent or manager of change (McCormick, 2001). Others have suggested that the use of computers in classroom can change the interactions between teacher and pupils and might produce a less competitive classroom culture (Snyder, 1993). McCormick and Scrimshaw (2001) have argued that there are three levels of change that could be brought about by the introduction of ICT to: (i) improve efficiency of conventional teaching, (ii) extend the reach of teaching and learning and (iii) transform teachers' and learners' conceptions of the subject itself.

OECD (2001) acknowledged that the introduction of computers into education can contribute to its improvement. Cox *et al.* (2003) concludes that the 'evidence from the literature shows the positive effects of specific uses of ICT on pupils' attainment in almost all the National Curriculum subjects' (p.33). Ofsted (2004a) reporting on the impact of

government initiatives argues 'the best uses of ICT bring clear benefits to teaching and learning that maximize the power of the computer to do things which were difficult or impossible to do in other ways'. Ofsted (2004b), based on subject-specific evidence from visits to primary schools, also reports that:

- improvement in the provision of ICT leads to improvement of pupils' ICT achievements;
- teachers' confidence in using ICT is reflected in the quality of teaching and learning;
- pupils' attitudes to learning in lessons involving ICT are very good.

Pittard *et al.* (2003) reviewing and discussing recent large-scale studies of the impact of ICT on pupils conclude that its proper use has a positive impact:

- on enhancing pupils' attainment (Harrison *et al.* 2002; Hayward *et al.*, 2003)
- on motivating pupils and encouraging them to engage in learning within and beyond the classroom (Comber *et al.*, 2002; Somekh *et al.*, 2002, Hayward *et al.*, 2003; Kington *et al.*, 2003; Passey *et al.*, 2003).
- on enhancing the process of learning itself as well as the products (Comber *et al.*, 2002; Triggs *et al.*, 2003).

Some of the ways in which research shows that the appropriate use of ICT may support teaching and learning are summarized as:

(i) From pedagogical point of view:

- Provide an insight into new or different learning and teaching environment (Simpson, 2000), pose interesting problems to students, extend their learning

opportunities and the capabilities of their minds to think productively and effectively (Pratt, 1995; Knight and Knight, 1995; Mumtaz, 2000), thus enhancing the learning process (Cox, 1993);

- Reduce the required time to cover content (Simpson, 2000), individualize learning and promote the declarative knowledge (Mumtaz, 2000);
- Motivate teachers and pupils and heighten pupils' interest and enjoyment of subjects, create a positive status of the subject in which ICT is used (Gardner *et al.*, 1994; Rodrigues, 1997; Cox, 1997; Dede, 1998; Cox *et al.*, 1999; Mumtaz, 2000; Forcheri and Molfino, 2000) and increase pupils' willingness to spend more time and make much more effort on a subject (Shute and Gawlick-Grendell, 1994; Somekh, 1996; Bonnett, 1999);
- Focus pupils' attention on the work in hand, aid their concentration and produce standards of work of higher quality (Johnson *et al.*, 1994);
- Help pupils to improve the presentation of their work, to feel more pride in their product in relation to that achieved with more conventional media (Johnson *et al.*, 1994);
- Enable teachers demonstrate, explore or explain aspects of their teaching and pupils' learning more effectively (Trend *et al.*, 1999);
- Enable teachers and pupils to have access to an enormous range of historical, recent or immediate information (Trend *et al.*, 1999; Mumtaz, 2000) and to exchange ICT-based information, which pupils understand, evaluate and summarise (Ofsted, 2004a).

(ii) From lifetime skills point of view:

- Improve the quality of the content of the curriculum materials teachers produce for their pupils and of the content of the students' coursework or assignments (Simpson, 2000), reform curriculum to adopt more student-centered and constructivist approaches to education (Plomp *et al.*, 1997; Driscoll, 2001) or

center it on problems parallel to those adults face in real-world settings (Dede, C. 2000);

- Promote in students attitudes of responsibility and autonomy in their learning (Bonnett *et al.*, 1999; Simpson, 2000, Mumtaz, 2000), promote self-directed and self-regulation learning skills (Mumtaz 2000; Driscoll, 2001) and make them feel more confident and show a greater co-operative behavior (Ryan, 1991);
- Allow immediate communication and collaboration among pupils during the learning process (Dede, 2000; Driscoll, 2001) and sharing computer- based information (Trend *et al.*, 1999; Wheeler, 2001), support interaction between pupils and promote cooperative learning (Scrimshaw, 1993; Littleton and Light, 1999; Underwood and Underwood, 1999; Littleton, 1999; Mumtaz, 2000) and involve students in virtual communities of practice (Dede, 2000);
- Involve pupils in activity for a long time, give them the opportunity to work in an open-ended way and enable them to become involved in more complex and challenging learning situations than those typically experienced (Johnson *et al.*, 1994);
- Help teachers to simulate a huge range of real-life situations and give teachers and pupils as well the possibility to interact with the computer: make choices, take decisions, add information as the model/situation progresses and responds to the situation (Trend *et al.*, 1999).

(iii) From future professional use point of view:

- Introduce students to a range of techniques they are likely to meet in their future work (Simpson, 2000).

Beyond this literature evidence shows that ICT can have a significant impact on pupils with emotional and behavioral problems or pupils with special educational needs (SEN)

and play an important role in inclusive education. Pittard *et al.* (2003) note that, because SEN covers a hugely diverse range of pupils it is impossible to draw general conclusion about the impact of ICT on pupils with SEN. However computers may well play a significant role in the development of personal relationship and social skills and contribute to a more direct and free communication and expression (Jones, 1996). ICT can provide SEN pupils with a non- threatening environment in which to achieve success. It can also render the teacher-pupil relationship less confrontational and the teaching more individualized, with emphasis on discussion and problem-solving rather than passive listening (BECTA, 2001). ICT properly used has the unique capability to generate knowledge, to foster success for all students through special measures and thus aid the disabled and the disenfranchised pupils (Dede, 2000).

Mumtaz (2000) reviewing the relevant studies of the past 20 years says that they highlight that a computer can be a vital aid for children with physical or learning difficulties; that it can help them to produce work without the combined problems of spelling or handwriting and concentrate on the content, to improve spelling and enlarge vocabulary and to encourage imagination through different sorts of presentation. McCormick (2001) observes that 'the support of special educational needs (SEN) pupils in classroom can be transforming for individual pupils, and for the teachers and classroom assistants that support them' and that new technologies could reinforce pupils' with SEN ability to participate.

BECTA (2003b) revising the available research about how ICT can support inclusive practice in schools outlines (i) the general benefits, (ii) the benefits for students, (iii) the benefits for teachers and non-teaching staff and (iv) the benefits for parents and carers and includes the following key benefits:

- Enables greater autonomy for learners;
- Unlocks hidden potential for those with communication difficulties;
- Promotes practice that reaches beyond the school into home and the community.

Likewise, National Centre for Technology in Education (NCTE) (no date) alluding to benefits of using ICT in classroom note that ICT has a potentially large role to play in supporting students' learning, especially those with moderate, severe or profound disabilities. NCTE suggests that ICT can:

- promote independence and communication;
- provide a multi-sensory approach to the teaching of essential skills and concepts in a variety of contexts;
- reinforces the concept of 'cause and effect' and other simple concepts;
- facilitate the development of motor skills, eye tracking and hand-eye coordination, communicative situations, language development and social interaction;
- provide motivating and stimulating learning experiences;
- allow pupils to work at their own pace and give them instant feedback to their responses.

These findings are endorsed by the recent Ofsted (2004 a, b) reports where is referred that:

- the use of ICT in special schools enables many pupils to have some independence in literacy lessons
- in reading instructions, can raise the expectations of teachers and parents as to the potential of very young people, even those with severe disabilities,
- extends their willingness to write and to share their work with other members of the class
- helps them to exceed their expected levels of achievement.

It is believed that the use of ICT in classroom has changed the lives of many people with special educational needs, has enabled them to participate to a greater extent in learning communities (Blamires, 1999; McKeown, 2000) offering as many possibilities for inclusive learning (Abbott, 2002).

Generally speaking computers have the potential to support collaboration, creativity, independent learning, supervision and reflection (Tweddle 1997) and may have a positive impact on both teachers and pupils' performance (Driscoll, 2001). The introduction of ICT in classroom could bring about some significant changes such as to improve the efficiency of conventional teaching, to extend the reach of teaching and learning and transform teacher's and learner's conceptions of the subject itself (McCormick, 2001).

The above findings about effective ICT use in classroom are reinforced by the conclusions of the ICT Test Bed Project (2002-2006) (Somekh *et al.*, 2006,). More specifically, this Project concludes that use of technology can:

- improve learners' motivation and their capacity to learn;
- make pupils spend more time on the quality and the creativity of their work:

- increase their participation with the group and their self-confidence;
- improve the concentration span of children, even those with SEN;
- enhance problem-solving creativity and critical thinking;
- increase pupils' ability to initiate activities;
- improve pupils' social and collaboration skills.

2.3.1 Teachers' Conceptions about the Potential of ICT

However, not all researchers share this optimistic view for the 'unique' role ICT could play in education. Olson (1981) expresses the idea that computers offer teachers ways to improve and enhance teaching and learning, but at the same time adds that teachers' efforts to achieve the full benefits of computers in classroom may require them to tolerate more ambiguity, to increase individual attention, and engage students in divergent thinking. Others maintain that computers in school threaten the illusion teachers have about the task they are doing (Solomon, 1986; Watson, 1987) and set some pre-conditions that secure its proper use. Cuban (1993) emphasises the risks and dangers of inappropriate use of computers, while Healy (1998) questions 'blind faith' in technology. In contrast to those who see computer as a 'panacea' for solving problems of underachievement and as a way of raising standards of student performance, it is said that putting a computer into a school is 'like putting a jet engine on a stagecoach; you gain a temporary increase, but then the whole thing is wrecked' (Kenny, 2000, p.27).

Even those who do not deny potential benefits from the use of computers in education suggest that they are not impersonal tools for autonomous use (Jones and Mercer, 1993, p. 22) and ask whether these benefits could be achieved by other conventional methods

(Bonnett *et al.*, 1999). It is stressed that the simple use of computers in education does not produce learning gains, because there are many other factors to consider, underlining that a definite link that exists between ICT use (as cause) and improved pupils' performance (as effect) is illusory (Rudd, 2000). Davis *et al.* (1997) point that:

It would appear that the conditions for classroom learning can be improved by information technology tools but, equally, teachers can use information technology to create a new set of mundane tasks which negate the opportunities for quality learning.

(p.25)

According to Rudd (2000) IT and computer projects cannot simply be 'bolt on' or 'imported' to school development. They further add that inappropriate use of computers in classrooms might depersonalise the student-teacher role and make their relationship less personal, less direct and straightforward, and that this could cause difficulties of classroom organisation and management and load the teacher with an additional role as change agent or manager of change (Rudd, 2000).

Some speak of the 'computer dream' where expectations run high concerning the potential contribution of computers to educational improvement, while some speak of the 'computer nightmare' and see the potential negative effects computer applications in school might have. Between these two extremes stand those who accept the positive contribution of computer use and agree to incorporate it into pedagogical practice, but put some pre-requisites for its full integration into education (Driscoll, 2001).

2.3.2 Factors that Prevent Teachers from Using ICT in Classroom

The literature shows that even now, after the New Opportunities Fund (NOF) initiative, the National Grid for Learning (NGfL) strategy, and the Computers for Teachers schemes introduced in the UK many teachers avoid incorporating the use of computers in teaching and learning.

The above and other relevant studies (Sheingold and Hadley, 1990; Dupagne and Krendle, 1992; Winnans and Brown, 1992; Brummelhuis and Plomp, 1993; Rozen and Weil, 1995; Robertson, 1996; Selwyn, 1997; Cox *et al.*, 1999; Pelgrum, 2001; Preston *et al.*, 2000, Snoeyink and Ertmer, 2001; Dawes, 2001; BECTA, 2004; Nachmias *et al.*, 2004) show that the most important factors that inhibit teachers from integrating the use of computers into their teaching are:

I. No prior computer experience and lack of teaching experience with ICT

Although Oliver (1994a) suggests that teachers' uptake of computers in classroom does not depend upon personal expertise in their use, the majority of researchers agree that lack of computer experience is a serious impediment. Wild (1995) feels that student knowledge, skill and attitudes regarding computers affect the stance they take towards using them in classroom. Similarly, Selwyn (1997) found that a major factor that deters teachers from using computers is 'computer phobia' which could be caused by the lack of computer or teaching experience with computer and Pelgrum (2001) classifies insufficient knowledge and skills regarding ICT as a non-material factor that prohibits the integration of ICT in

teaching. Dorothy *et al.* (2000) recognise that skill and comfort levels of teachers are a serious factor and that teachers themselves classify their needs into four categories: (i) technical skills and knowledge, (ii) application of ICT for general and pedagogical use, (iii) management skills and knowledge related to ICT in general and classroom oriented and (iv) teaching ICT skills. Galanouli *et al.* (2004), alluding to issues which affected the New Opportunities Fund (NOF) training in UK (1998/9-2002/3), found that teachers commented negatively on its delivery and content and that unless they had prior knowledge, they could not benefit from the training. BECTA (2004, p. 19) refers to lack of confidence as an internal or teacher level barrier to implementing ICT in the teaching and learning process.

II. Limited number of computers and lack of computer availability

Researchers almost unanimously accept that a key reason for which teachers do not to make regular use of ICT in their classrooms is lack of easy access to the relevant equipment, although some accept that a simple increase in numbers of computers and connectivity do not guarantee successful and effective productive use (Pelgrum, 1999; Granger *et al.*, 2002). Lynch (2000), also agrees that scarcity of equipment is the most obvious factor that makes the integration of computers in schools difficult and explores the 'history of use of computers laboratories' and further notes that the housing of computers in laboratories or computer rooms, that usually are the domain of IT teachers, might inhibit the ability of non-computer specialist teachers to organise access to computer-based technology for their students, a further barrier in integrating computers in the teaching and

learning process. Culley (1986, p. 89) writing about the competition among teachers that inevitably emerges from computer rooms compares the situation with the access to the lunch-time IT club and says: 'if access to the lunch-time club is on a 'first come-first served' basis, then it is likely that one group will tend to dominate...thus blocking the access to other groups'. Similarly, Mumtaz (2000) observes that limited resources mean limitations on what teachers are able to do with ICT, and this results in the lack of sufficient computer experience for both pupils and teachers. Granger *et al.* (2002) put the relevant problem into two categories (i) total lack of ICT and (ii) lack of ready or easy access when needed and O'Machony (2003) reveals that teachers nominated the quantity and quality of classroom resources among the 10 most important issues relevant to the use of ICT. According to Mulkeen (2003) schools with computers usually had higher subject use and according to Tearle (2003) teachers need to have (i) one or two machines in some teaching rooms as well as the 'whole room' facilities, (ii) more flexibility of access so teachers could use the computers when they wanted them and not on a pre-defined timetable, and (iii) more subject specific software.

The importance of schools being well resourced with ICT equipment, and of giving access to teachers, is also highlighted by a recent BECTA publication (2003a), while BECTA's (2004) most recent review of the relevant research literature refers to different kinds of access problems such as lack of hardware (Guha, 2000; Pelgrum, 2001), poor organisation of resources (Fabry and Higgs, 1997; Pelgrum, 2001), poor quality hardware (Fabry and Higgs, 1997; Preston *et al.*, 2000), inappropriate software (Guha, 2000; Bosley and Moon,

2003) and lack of personal access for teachers (Ross *et al.*, 1999; Cox *et al.*, 1999, Guha, 2000; PricewaterhouseCoopers, 2001).

III. Lack of on-site support for teachers using technology

The need for on-going support is regarded by researchers and teachers as a complex and challenging area. Dorothy *et al.* (2000) group the relevant needs of teachers into three distinctive forms: (a) technical support, (b) evaluation of resources and (c) supportive organisational culture. Teachers in her study stressed the need for locally available support within school, e.g. a computing specialist able to help with technical problems, an ICT coordinator for support in selecting and evaluating ICT resources and support from the head teachers and educational services.

Cuban (1999) points out that in schools that can not afford technicians breakdowns may occur and the equipment remain out of use for a long time. Some find that there is a strong link between equipment breakdowns or the fear of doing damage to equipment and teachers' lack of confidence (Cuban *et al.* 2001; Snoeyink and Ertmer, 2001; O'Machony, 2003).

More recently BECTA's (2004) review appears to consider lack of technical support and assistance as an external or school level barrier to the use of ICT for educational purposes, while Nachmias *et al.* (2004) go further and suggest that, in contrast to the prevailing view, technical support seems to be more valuable than the number of computers. Tearle (2003) alludes to some other forms of support beyond traditional technical support such as

encouragement from senior management, practical help from students with ICT skills and the support of colleagues in the school or department. Research evidence clearly shows that schools, as institutions, do not provide a supportive network for teachers, who are not confident enough to embed computers in their teaching (Dupange and Krendle, 1992; Winnans and Brown, 1992; Sheingold and Hadley, 1993; Rozen and Weil, 1995; Mumtaz, 2000).

IV. Lack of time required for the integration of ICT into teaching practices

In recent years a great number of studies have dealt with lack of time as one of the most serious factors that deter teachers from integrating ICT into education (Winnans and Brown, 1992; Dupange and Krendl, 1992; Sheingold and Hadley, 1993; Rozen and Weil, 1995).

Simpson *et al.* (1999) investigating the use of ICT as a pedagogical tool note that time is required for teachers to successfully integrate technology into the curriculum, to develop computer related lessons and enhance practical skills. Wheeler (2001) notes that the use of computers requires a great deal of investment from teachers in terms of time, effort and general commitment. Pelgrum (2001) too puts insufficient teacher time among the non-material obstacles that make difficult the implementation of computers in classroom activities. Moreover, Dawes (2001, p.70) shows that lack of time was not cited as a barrier by those teachers who had a sense of purpose for ICT use, because, as she says, 'Teachers wishing to use ICT to support their work with classes found time to do so' but also found

that teachers in high schools felt that they under-used computers, because of lack of time to become familiar with them.

Wheeler (2001) observes that ICT applications can simplify and rationalise many of a teacher's tasks and, thus, free up teachers' time which might be better spent by them in preparation of lessons and teaching, but Dawes (2001) questioned this statement saying that the computers' processing speed is phenomenal but that this does not mean that learning is similarly accelerated. Pelgrum (2001), on the other hand, emphasises that it is in the nature of imposed change that teachers are rarely given sufficient time in which to acquaint themselves with changes, to plan and prepare for them.

Most recently BECTA (2004, p. 15) found that teachers ask for more time in order to be able to experiment with the technology, share their experiences with their colleagues, attend technology related in-service training programmes, locate internet advice, prepare lessons and resources, explore and practice using technology, face technical problems.

V. Age and gender differences between teachers

Age and gender differences between teachers may affect take up of ICT. Bradley and Russell (1997) found that computer competence or anxiety do not vary significantly with respondent age, but BECTA's survey (2004) and a report by the European Commission (2002) found that percentages of teachers using computers in their lessons falls as their age increases, while Bradley and Russell (1997) and Yuen and Ma (2002) show that females have a greater degree of IT anxiety than males.

2.4 Teachers as the Key for Implementation of ICT in Classroom

Some teachers use computers because their conceptions of using these machines already fit within their existing notions and practices (Sheingold and Hadley, 1993) or because they can easily assimilate innovative practices using ICT according to their beliefs (Drenoyianni and Selwood 1998; Moseley *et al.*, 1999; Higgins and Miller, 2000; Higgins and Moseley, 2001). Teachers who value ICT highly and regard it as useful for their job are able to take advantage of IT capabilities and transform their teaching (Cox *et al.*, 1999, Pedretti *et al.*, 1999). Teachers who are motivated and strongly committed to their pupils' learning and their own professional development are willing to integrate computer use for educational aims (Moseley *et al.*, 1999; Becker and Riel, 2000).

A rich amount of literature suggests that the stance of teachers, especially new teachers, towards the role that modern technology can play in teaching and learning is a basic prerequisite for the successful integration of ICT into classroom activities (Robertson *et al.* 1996, Davis *et al.*, 1997, Bonnett *et al.*, 1999, Rudd, 2000). Teachers are an intrinsic part of the change process and a major component of all successful school improvement programmes.

When teachers are not convinced that the planned change will help teaching and learning, it is almost certain that it will fail. Borko and Putnam (1995, p. 38) suggest that in order for teachers to adopt educational innovations, such as ICT, they need 'to think in new ways

about students, subject matter, and the teaching-learning process', that means that for school improvement to occur teachers need to be committed to the process of change which will involve them in examining and changing their own practices (Joyce, 1990; Pelgrum and Plomp, 1993; Watson, 1993; Gilmore, 1994; Robertson *et al.*, 1996; Cox *et al.*, 1999; Sergiovanni, 2000; Higgins and Moseley, 2001). That is why some training designers plan training programmes focusing not on ICT itself, but on changing their beliefs and practices (Baki, 2000).

Veen (1993) sees 'teacher factors' as outweighing the institutional or school factors and Higgins and Moseley (2001) regard teachers' beliefs as lenses through which educational changes are viewed. The negative stance of teachers towards the use of ICT in education as acts as a 'second-order' barrier that requires major changes in daily routines and beliefs about effective practice (Ertmer, 1999; Snoeyink and Ertmer, 2001).

2.5 Initial and In-service Training of Teachers as a Factor Promoting ICT Integration in Classroom

Research shows that appropriate pre-service and in-service training is a critical contributor to successful implementation of computer systems in educational practice in general (Millin and Barta, 1991; Young, 1991; Solomon, 1992; Grover and Teng, 1994; Someck and Davis, 1997; Huey-Wen Chou, 2001) and in classrooms more specifically (Makrakis, 1990; Baron and Bruillard, 1994; Lienard, 1995; Murray and Collison, 1995; Moon, 1995; Lewis, 1995). Teachers who have received computer training demonstrate less anxiety and

feel more confident than teachers who have not received any training (Pope-Davis and Wispoel, 1993; Preston *et al.*, 2000), and the reason for the unwillingness of some of the younger generation of teachers to introduce ICT into their classroom is sometimes to be found in ineffective training provision in the use of ICT in teaching and learning (Watson, 1997; Murphy and Greenwood, 1998; Strudler *et al.*, 1999; Galanouli *et al.*, 2004).

It is true that equipping student-teachers with personal skills in IT is little guarantee that they will use computers in classroom (Oliver, 1994) and that even substantial training does not necessarily lead to a change in practice in the school (Cox *et al.*, 1999). However, in spite of these reservations teachers' pre- and in-service training must be taken into account. Cox *et al.* (1999) and Dawes (2001) discussing the factors that motivate teachers to use ICT in classroom include among them the level of teachers' training, and almost all those who agree to incorporate computers into pedagogical practices regard training as an essential pre-requisite for doing so (Driscoll, 2001).

Teachers' training is closely related to concepts such as confidence, competence and self-efficacy. Wild (1995) believes that confidence and competence in the use of computers go 'hand to hand'. But lack of confidence to use ICT in classroom is closely related to lack of knowledge about classroom uses of ICT (Little, 1996; Lynch, 2000). Appropriate pre- and in-service training is widely recognised by policy makers, for example Stevenson Report (1997), the British Educational Communications and Technology Agency (BECTA, 2004) and the English Teacher Training Agency (TTA, 1998).

2.5.1 Initial or Pre-service ICT Teacher Training

It is generally accepted that student teachers who have taken ICT courses during their initial education find this an important factor that assists in acquiring the necessary confidence to use ICT effectively in their teaching careers (Dunn and Ridgway, 1991; Trushell *et al.*, 1994; McFarlane and Jared, 1994; Murray and Collison, 1995; Robertson, 1996). Only a small number of the factors determining the uptake of IT use by students and beginning teachers are addressed by pre-service IT programmes (Wild, 1991, 1995; Grunberg and Summers, 1992; Byrum and Cashman, 1993) and the bridge, the so called 'performance gap', between teachers' intention and their practice (Wild, 1991) was not being met. The initial teacher training National Curricula for the use of ICT in subject teaching has not accomplished the necessary pedagogical grounding for the use of ICT in classroom (Fisher, 1996; Joyce and Showers, 2002).

Several factors can make student teachers' training ineffective. The most serious are:

- Absence of relevant context and the lack of practice in the use of ICT in the classroom by student teachers (Wild, 1995; Barton, 1996; Hughes, 1997);
- Student and newly qualified teachers are mainly preoccupied with keeping classroom order and do not think of using ICT in their day-to-day teaching activities or are not encouraged to use ICT during their initial training and their teaching practices (Murphy and Greenwood, 1998);
- Teacher-trainers do not have the knowledge and experience needed to teach the application of ICT in teaching and learning (Murphy and Greenwood, 1998);

- Pre-service teacher training focus usually on ‘know how’ rather than on how ICT could be implemented in school for improving the teaching and learning process (Veen, 1993).

It is suggested that for initial teacher ICT projects to have a positive impact on educational activities it needs:

- To keep pace with in-service provision and work in cooperation with that (O’Donnell, 1996; Kennewell, 1997);
- To be based on a curriculum that will incorporate the pedagogy of ICT using in subject teaching (Kennewell, 1997);
- To be provided by re-educated teacher-trainers (Kennewell, 1997; Charalambous, 2001).

2.5.2 Models and Modes Employed in Teachers’ In-service Training

Models of teachers’ ICT training have often failed to accomplish their purposes and to contribute to teachers’ development, and also to school improvement, because they have not meeting teachers’ professional needs. A training model is recommended that establishes opportunities for immediate and sustained practice, classroom observation, collaboration and peer coaching (Harris, 2002, p. 100). Owen (1992) outlined the models mostly used in the ICT teacher in-service training. These briefly are:

- The hardware-centered model: This places the machine at the centre of the training process and uses software for acquiring computer operational skills;
- The software-centered model: This usually uses educational developments of commercial tools such as word processors or information retrieval software and in

this 'it is still essentially the computer that is the centre of the course structure' (Owen, 1992, p. 129);

- The curriculum centered model: This is based on the concept that resources are developed with the curriculum in mind focusing on ways in which computers could be used across the curriculum and provides teachers with opportunities to explore more deeply the applications of software for curriculum use (Steadman *et. al.*, 1995);
- The child or classroom centered model: This is based on the concept of developing the active reflective teacher and on the concept of research collaboration between school and university in order to develop an action research network for support of teachers who introduce changes in their classes.
- The whole school-focused model: This is based on the rationale that, although the teacher is a key factor for every educational reform and change, implementation of ICT in the educational process implies changes at school level (Veen, 1993, Cox, 1997) and aims to provide the whole school with good co-ordination, shared sense of values, staff and curriculum long term development (Owen, 1992);
- The teacher centered model: This is characterised by the opportunities it gives to teachers to reflect on their own beliefs and assumptions and provides sufficient support to bring about action and change. It begins by identifying the needs of individual teachers and goes on by providing them with support either through designated courses and/or through the one-to-one training and support from the school ICT co-coordinator or an advisory teacher (Charalambous, 2001);
- The cascade model: In this model a small number of teacher-trainers are trained first, then they are cascaded to train a larger, more widespread layer of teacher-trainers and so on usually within their school vicinity via short courses.

Joyce and Showers (1988, p. 34) observed sessions that included activities combining (i) theory, (ii) practice, (iii) feedback and rarely (iv) assistance in the classroom, and identified some structural components that if used in combination could contribute to build the capacity for implementation of reforms and innovations. These are:

- Presentation of theory or description of skill strategy;
- Modelling or demonstration of skills or models of teaching;
- Practice in simulated classroom settings;
- Structured and open feedback (peer observation);
- Coaching for application.

Brown (1994) promotes a three stage instructional model. The first stage provides teachers with confidence and competence, that is a necessary condition for classroom computer use, the second stage enables teachers to support classroom implementations and the third stage involves reflective practice. Similarly, Casey (1996) outlined five phases of development: (i) teachers learn principles of computer operation, (ii) teachers are motivated to search for information about the benefits of ICT, (iii) teachers try to find concrete examples of successful use of ICT to use in classroom activities, (iv) teachers try to apply ICT use in their teaching; and (v) teachers try to establish and sustain the programme through constant technical and psychological support from the head-teacher and the administration.

McDougall and Squires (1997) also offer five typical loci and methods by which teachers obtain professional development experiences: (i) skills in using particular software

applications, (ii) integration of IT into existing curricula, (iii) IT-related changes in curricula, (iv) changes in teacher roles and (v) underpinning theories of education.

More widely known is Sandholtz's *et al.* (1997) five stages typology: the 'Entry' stage, where teachers do not yet feel comfortable with the use of ICT, the 'Adoption' stage, where teachers incorporate ICT use to support traditional methods of teaching, the 'Adaptation' stage, where teachers adapt their style to the benefits of an effective use of ICT in classrooms, the 'Approbation' stage, where teachers feel confident in using ICT and exploit its communicative and collaborative advantages, the 'Invention' stage, where teachers fully integrate the potential of ICT with their own vision of teaching and learning.

Makrakis (2002, pp. 493-494) developed in the United Arab Emirates (UAE) a three year strategy for planning. This consisted of seven components, not steps in a linear process, but rather areas of consideration that function dialectically. These components and the relevant tasks are:

- 'Situation analysis': identifying needs, requirements, supports, and barriers in ICT contextual areas.
- 'Action Plan Framework': analysis of ICT innovation in education, creation of vision and goals and defining the expected results.
- 'Designing an ICT model': on the basis of international experience about ICT use in schools and defining its cost.
- 'Developing the infrastructure': software, hardware, networking etc.

- ‘Establishing ICT Partnerships’: developing and funding strategies to meet public support for the ICT plan.
- ‘ICT Implementation in Schools’: evaluating and acquiring educational software, hardware and networking equipment; developing and implementing curriculum training for teacher-trainers, for ICT resource teachers.
- ‘Ongoing Monitoring and Evaluation’: mechanisms for monitoring and follow-up of the ICT plan; evaluation and further exploitation of the outcomes.

Charalambous and Karagiorgi (2002) evaluating ICT in-service training for teachers in Cyprus saw a typical process employed in ICT INSET sessions which included (i) theory presentation, (ii) some discussion, (iii) demonstration of software, (iv) hands-on practice, (v) a sort of summary and (vi) an evaluation of the course during the last session. They suggest a national plan for ICT INSET that should reflect ‘coherence, availability, efficiency and diversification’. Earlier, Charalambous (2001, p. 100) stressed that the teachers are not in favour of afternoon sessions after school hours, especially those which last three hours. In contrast, an ICT training course of one year’s duration, leading to the acquisition of a recognised certificate, and followed by school-based courses is popular among teachers.

In order to define the traits of an effective ICT training programme it is worth referring to the findings of the independent research carried out on NOF training that was judged as unsatisfactory. These findings showed that factors that led to a lower training uptake than that anticipated were: (i) that NOF training was undertaken by teachers in their own time and they had to master an extensive range of competences (Kirkwood *et al.*, 2000), (ii) that

the roll out of equipment and communication links was too slow (Kirkwood *et al.*, 2000), (iii) that no central funds were available to develop course material (Kirkwood *et al.* 2000) and (iv) that the context and the quality of the training provided was not sufficient (Lightbowne, 2002).

On the other hand, the Approved Training Providers of the NOF training (Preston, 2004) suggested that there are fundamental factors that lead to the introduction of ICT in teaching such as:

- ‘positive learning culture and effective leadership’;
- the ‘recruitment and management of the trainers’;
- ‘elements of blended learning’ and ‘accreditation monitoring and tracking’.

The notion of ‘just in time’ learning, according to which the best time for someone to be introduced to a particular skill is just the time before s/he actually needs it, plays an important role in this model. Kingston (2000, p.7) observes that this kind of learning allows the learning to become ‘focused and conceptualised rather than fragmented and disparate’ and that ‘learning is automatically differentiated as it is specific to individual or group needs’.

The role of the ICT in-service teacher-trainer also is important. The term ‘ICT in-service teacher-trainer’ refers to the persons who are responsible for assessing the needs of teachers and schools, for planning and carrying out in-service educational training projects and evaluating their results (O’ Donnell, 1996). Teacher-trainers could be tutors and

teacher-trainers, professional developers, teacher consultants or advisory teachers and may be working in universities, teachers' training institutions, district educational offices, ICT teachers centres, in private or public commercial organisations or institutes, or even as members of the school staff. Williams (1991) referring to some aspects of the multi-dimensional role ICT teacher-trainers could play characterise them as: 'administrators', 'counsellors', 'evaluators', 'facilitators', 'identifiers of needs', 'innovators', 'monitors' and 'motivators'.

Transference of the training from the 'workshop' to the actual 'work place' is also regarded as a serious concern. As a result, two types of ICT teacher-trainers are often employed: the ICT co-ordinator and teacher consultant or advisory teacher. They sometimes work together and co-operate. The first type of teacher-trainer consists of staff members who have among other duties the responsibility to provide ICT support and training to their colleagues. The second type consists of staff members of a Teacher Centre or district LEA office who have responsibility to deliver ICT in-service to individual or groups of teachers or to the whole staff of a school.

These terms reveal the complex role that a teacher-trainer is called upon to play. Good teacher-trainers serve as models in some groups of competences (Koster and Dengerink, 2001) and train their teachers as they want them in their turn to train their pupils, while other researchers refer to their ability to:

- Put specific targets and aims (Steadman *et al.*, 1995);

- Plan tasks in small steps and to define the necessary time-table carefully for its completion (Steadman *et al.*, 1995);
- Know the stages learners go through during learning new things (Steadman *et al.*, 1995);
- Relate ICT to the educational requirement of the subject taught and to present pedagogical techniques aiming at pupil and computer-centred teaching (O'Donnell, 1996);
- Distinguish the point from which s/he must start her/his teaching, to evaluate the result of each step of ICT training before going to the next and to provide the necessary feedback (Steadman *et al.*, 1995);
- Develop good relations with the teachers (Griffin, 1996);
- Support the development of individual teachers, of the curriculum and the school through the initiatives s/he takes (Wild, 1991);
- Provide courses to fill observed and acknowledged particular needs (Wild, 1991);
- Discuss the requirements of schools and ensures that the services offered by external agencies, Teacher Centres or District Offices, can meet their particular needs;
- Be properly trained (Williams, 1991; Stephens, 1996) and to have first incorporate ICT in their own practice before they try to teach others how to use ICT in their classroom (O' Donnell, 1996; Cornu, 1997);
- Be expert reflective practitioners themselves (Stephens, 1996; Kydd *et al.*, 1997);
- Be reliable professionals with a good reputation and have the ability to develop good interpersonal relations (Pratt and Stenning, 1989);

- Be good listeners, ready to understand the deeper motives of teachers and able to analyse and comment on their positive and negative points in an objective way (Smith, 1997);
- Be supported in the framework of relationships s/he develops, on the level of the particular subject they are trained and on the level of the role they are called to play (Smith, 1997);

In contrast, some researchers speak negatively of ICT in-service teacher-trainers who lack knowledge of basic pedagogical techniques and strategies and do not help the teachers they train to use ICT in classroom (O'Donnell, 1996), or of over-technical teacher-trainers who do not understand their teachers' difficulties and intimidate them (Griffin, 1996). Such teacher-trainers lead teachers to resist the use of computers in subject teaching (McCormick, 1992). According to Galanouli *et al.* (2004), reviews on NOF ICT training in the UK showed that the most serious complaints of teachers about their teacher-trainers were that they under or overestimated teachers' existing knowledge, were not able to establish an effective relationship with teachers, because of the frequent personnel changes, and to communicate with them and did not differentiate their style of teaching during the training programme.

In order though for teacher-trainers to be able to work effectively, they should be left free to arrange issues relevant to the structure and the content of the training programme and the process of its delivery in cooperation with the teachers or/and the head-teachers of the schools involved, but at the same time they should have any support necessary to solve any

problem they meet, especially in centralised educational systems, by outside school agents (Fullan, 1991, 2001, Stoll and Fink, 1996).

2.6 Chapter Summary

Reviewing the general literature on innovation, change and professional development, implementation or introduction of ICT into teaching and learning process, and on effective teaching and learning leads to several conclusions.

I. When planning for change:

The literature suggests that, when planning a change, someone has to invest time and energy into it (Huberman and Miles, 1984; McGilchrist *et al.*, 1997; Hargreaves and Hopkins, 1994; Harris, 2002), to include teachers in the decision making processes (Fullan, 1991; Hargreaves, 1992; Vivancos, 1997; Harris, 2002), and set clear purposes and aims (Nias, 1989; Fullan, 1991; Gray and Wilcox, 1995; Hopkins *et al.*, 1997; Harris and Hopkins, 2000; Harris, 2002). It is necessary to introduce a change and to use a training programme that fits the particular needs of the people to which it is addressed and the particular traits of the educational system within which it is to be embodied (Williams, 1991; Passey and Ridgway, 1992; Steadman *et al.*, 1995; Craft, 1996; Hopkins, 2001; Harris, 2002; Goldstein and Ford, 2002).

The introduction of ICT in education for teaching purposes may result to changes in teacher roles and behaviours (Hoffman, 1996; Norton and Sprague, 1996; McDougall and

Squires, 1997; Pellegrino and Altman, 1997; NCET, 1997; Simpson *et al.*, 1999; Potter and Mellor, 2000; Kirschner and Wopereis, 2003; Kynigos, 2002; Taylor, 2003) which may lead to resistance or lack of commitment. The designers of the programme need to understand teacher reactions and appreciate differentiated response and take into consideration their opinions and take under consideration teachers' eventual feelings and reactions (Gray and Wilcox, 1995; O' Donnell, 1996; Fullan, 2001)

II. While planning the sessions of the programme

The relevant literature shows that no training could be effective, if it disregards the fact that different people have different needs and if it is not tailored to participants' needs and expectations (Williams, 1991; Creemers, 1994; Steadman *et al.*, 1995; Craft, 1996; Hopkins *et al.*, 2001; McLean, 2000; Harris, 2002, p. 37; Goldstein and Ford, 2002). Those planning training programmes should, before engaging the teachers in the training process, inform them about the potential and the benefits it could have for teachers and pupils as well, to be sure that the participants take a positive stance towards the tool they are to use in their daily practice (Nias, 1989; Fullan, 1991; Hargreaves, 1992; Guskey and Sparks, 1996; Baki, 2000; Harris, 2002; Guskey, 2002; Granger *et al.*, 2002).

In addition, teacher-trainers should be left free to arrange issues relevant to the structure and the content of the training programme and the process of its delivery in cooperation with the teachers or/and the head-teachers of the schools involved, but at the same time they should have any support necessary to solve any problem they meet, especially in

centralised educational systems, by agents from outside of the school (Joyce and Showers, 2002; Fullan, 1991, 2001; Stoll and Fink, 1996).

Furthermore, an ICT training course of one year's duration, leading to the acquisition of a recognised certificate, and followed by school-based courses is popular among teachers. Research evidence shows that the teachers are against afternoon sessions, after school hours and that they would prefer the training to be carried out by persons who have received a pre-training with attention given not only to new subject matter knowledge but also to the didactics of in-service training (Beck, 1997) and are models of effective teaching (Cornu, 1997)

III. While carrying out the training

The general literature points to the importance of employing differentiated methods of teaching or flexible approaches (Kyriacou, 1991; Creemers, 1994; Hopkins, 2001; Muijs and Reynolds, 2001; Harris, 2002) and combining theory and practice (Joyce and Showers, 2002; Joyce, 1992; Creemers, 1994; Harris and Hopkins, 2000; Harris, 2002). As regards ICT, training needs to 'fit for purpose' so that, while ICT skills are important, training must be carried out in curriculum context and illustrate appropriate use (Dimou *et al.*, 2002); using computers as a tool for teaching (Williams *et al.*, 2000; Kirschner and Wopereis, 2003; Charalambous and Karagiorgi, 2002; Potter and Mellor, 2002) and assessment (Kirschner and Wopereis, 2003); as a mind tool (Kirschner and Wopereis, 2003) and pedagogical use in general (McDougall and Squires, 1997; Kirschner and Wopereis, 2003). The training should be carried out by teacher-trainers who are not

perceived as 'expertise technologist', but as fellow teachers (Strange *et al.*, 1988 cited in Charalambous, 2001), who have received a pre-training with attention given not only to new subject matter knowledge, but also to the didactics of in-service training (Beck, 1997) and are models of effective teaching (Cornu, 1997).

IV. While implementing ICT in teaching

The general literature has demonstrated that in bringing about change it is important to build learning communities in schools (Barth, 1990; Joyce *et al.*, 1999; Senge, 1990; Hopkins *et al.*, 1994; Wenger, 1998; Stoll, 1999; Sergiovanni, 2000; Mitchell and Sackney, 2000; Fullan, 2001) build collaboration (Joyce and Showers, 2002; Nias, 1989; Darling-Hammond, 1990; Hargreaves, 1992; Little, 1993; Mortimore *et al.*, 1994, Hopkins *et al.*, 1996; Guskey, 2000; West *et al.*, 2000; Harris, 2002) and effective leadership (Sammons *et al.*, 1997; Leithwood *et al.*, 2002; Fullan, 2000; Jackson, 2000; Leithwood and Jantzi, 2000; Mitchell and Jackson, 2000; Sackney, 2000; West *et al.*, 2000; Harris and Bennett, 2001; Hopkins, 2001; Day *et al.*, 2002; Harris, 2002). It also suggests that ICT implementation is problematic and that take up of ICT imposes difficulties; that the training should provide easy access to machines, both at school and at home (Strange *et al.*, 1988, cited in Charalambous, 2001), and to be based on the infrastructure and the supplies provided by the school's in-service training manager (Steadman *et al.*, 1995). In addition, the training should provide the participants with the necessary time to plan, learn, practice (Joyce and Showers, 2002; Stoll and Myers, 1998; Simpson *et al.*, 1999; Dawes, 2001; Higgins and Moseley, 2001; Hopkins, 2001; Pelgrum, 2001; Wheeler, 2001;

Caraban, 2002; Leithwood *et al.*, 2002) and to give the necessary support for several technical and curriculum problems (Darling-Hammond and McLaughlin, 1995; Stoll and Fink, 1996; Dorothy *et al.*, 2000; Mitchell and Sackney, 2000; Preston *et al.*, 2000; Cuban *et al.*, 2001; Snoeyink and Ertmer, 2001; Harris, 2002; O'Machony, 2003; Tearle, 2003; BECTA, 2004; Nachmias, 2004). Furthermore, the training should promote a school culture that supports changes (Barth, 1990; Hargreaves, 1992; Leithwood *et al.*, 1995; Guskey and Sparks, 1996; Stoll and Fink, 1996; Hopkins, 2001; Mitchell and Sackney, 2000; Guskey, 2002).

V. While evaluating the impact of the training

The general literature on change and reform points to evaluation of the training outcomes (Southworth and Conner, 1999; Harris, 2002; Goldstein and Ford, 2002), to the use of observation (Cooper, 1989; Drummond *et al.*, 1992; Hopkins, 1993; Eraut, 1994; Day, 1999; Southworth and Conner, 1999), to the provision of the necessary feedback (Creemers, 1994; Eraut, 1994; McGilchrist *et al.*, 1997; Harris and Hopkins, 2000; Muijs and Reynolds, 2001; Joyce and Showers, 2002) and to the development of a learning cycle. These are true for ICT training too. Effective training must provide participants with the necessary feedback on their performance and should be evaluated both in formative and summarising way for improvement of its courses (Tulder and Veenman, 1991).

To conclude, introducing change is a complex procedure. The literature illustrates the constraints on change, it describes various types of change including stages and models and considers change on a teacher, school and policy level. After having defined the traits

of an effective ICT in-service training programme, there is a strong base on which to investigate the specific EE training programme, the focus of the thesis. The next chapter focuses on the selection of the appropriate research methods, which will answer the questions set at the beginning of the study.

2.6.1 Main Issues Emerging from the Literature

According to the literature, when planning a change, it is important to take into consideration:

- the time to be invested
- the teachers' opinion in the decision making
- the importance of setting clear aims
- the needs of the participants
- the characteristics of the educational system.

In planning in-service sessions training providers should in advance:

- inform the participants about the programme
- assure that the participants take a positive stance towards the programme
- encourage teacher-trainers to innovate while providing the desired support
- consider ways of awarding participants for getting involved in the training.

When carrying out the training, the literature underlines the importance of:

- blended and flexible methods of teaching
- combination of theory and practice
- context related training sessions

- specific examples of using computers as a tool for teaching and assessment as a mind tool
- ensuring teacher-trainers are appropriately trained in IT skills and ICT pedagogy.

For the implementation of ICT in teaching, the literature suggest it is crucial to:

- build learning communities in schools;
- promote effective leadership;
- provide appropriate infrastructure;
- offer participants time to plan, learn, practice;
- give the necessary technical and subject support;
- create a school culture which is open to change .

Last but not least, the literature focuses on the importance of presenting the participants with feedback on their performance.

2.6.2 Addressing existing gaps

Research on training programmes has some important weaknesses. In terms of content, some studies offer simplistic explanations for the lack of impact of training programmes. They blame either the trainers or the teachers or the head-teachers, rather than offer a holistic explanation. In addition, much of the published literature presents cases from the United Kingdom and the United States and other contexts in which English is a first language. In this way, the particularity of different national contexts is underrepresented.

In terms of methodology, many studies are likely to collect data from one source, either teachers or training providers, while using one method of data collection, either

questionnaires or interviews and rarely observations. In addition, their approach to the literature review is quite narrow focusing mostly on ICT related studies and missing the general studies on in- service training.

This case study adds to the research by drawing together literature from ICT and non ICT context; by considering an under reported national context (Greece) and taking a holistic approach to data collection, the seeking the views of teachers, trainers, head-teachers and programme designers.

CHAPTER 3: THE METHODOLOGY OF THE RESEARCH

3.1 Introduction

The main aim of the research is the investigation and description of an in-service ICT training programme and its impact on the teachers' practice. The training programme is EE, which was an attempt to introduce computers into subject teaching. The teachers taking part in this training programme were organised around broad curriculum areas (science, mathematics, philology). The area of interest of this study is the impact of the programme on 99 philology teachers (teachers who teach Ancient and Modern Greek Language and Literature, History, Latin, Citizenship, Religious Education) who worked in 56 different low level and high level secondary schools in the wider area of Athens. The training was provided by three teacher-trainers, who had attended a special post-graduate degree in three different Greek Universities and took place in the IT suites of six schools, out of school hours, for a full academic year, three hours, once a week. The research took place during the year 2003-2004 and the tools used were: questionnaires distributed to teachers who had attended the training, interviews with those teachers, their teacher-trainers, the head-teachers of their schools and some academics and training programme designers, observation of training sessions, as well as review of relevant literature and documents concerning the design and implementation of the EE training.

3.2 Overview of the Research

The whole process of the research, which started in October of 2002, developed as follows:

The first stage of the research was time consuming and focused on literature review, and the numerous studies, undertaken in a range of different countries. This is described in Chapter 2. The literature review examined areas such as educational change and reform, the introduction of ICT in education, the role of the teachers in the introduction of ICT in the schools, the role of professional development, effective practices of in-service ICT training.

In order to gain an understanding of the framework of the use of ICT in Greek schools, the literature review also included reports for extended or wider audiences concerning the EE and TSC programmes, government documents such as those published by the Greek Ministry of Education and Religious Affairs at a national level. Conference publications from people involved in the programmes and materials were used (local level) as well. This was used to provide the background in Chapter 1 (section 1.5).

In the second stage an exploratory study is conducted. Three TSC training sessions were observed. They took place in three different training centres with different teacher-trainers, each having ten to 15 teachers and lasting three hours. This programme entitled 'Preparing Teachers of the Information Society' took place in secondary schools' IT suites and was addressed to teachers from primary and secondary education of various specialism. The observation (see Appendix I for observation schedule) focused on the conditions under

which the training was provided and whether the objectives put by the Ministry were being met. In addition, one session of the in-service training programme 'In-school Training in ICT' (EE), the last of the year 2002-2003, and in fact the last of the programme was attended. The session was addressed to ten teachers of the same specialism coming from schools of the same district and lasted three hours.

During this process I had the opportunity to have discussions with teachers, to distribute questionnaires, and obtain information relevant to their professional and personal status and to their ICT training: their age, subjects which they were teaching in schools, ownership of computers, ICT skills, previous ICT experience, type of the training they attended and its value, use of computers, difficulties in ICT use etc. One further session of the same teacher-trainer with a different group of teachers was to be attended, but the session was cancelled, because of a virus that infected the computers. Furthermore, there were meetings with (i) one of the managers of the Office of the Information Society in the Ministry of Education who gave me mostly details about the organisational aspect of on-site training and talked about the future of the EE ICT training programme and the teacher-trainers, and (ii) a Professor of the University of Athens who was a member of the Committee that had planned and initiated the EE ICT training programme and specialised in postgraduate programmes of future teacher-trainers. He was able to help me in the future.

The main issues on which I focussed during my exploratory study were the conditions of the training, the physical environment, the characteristics of the teachers and the teacher-

trainers, the methods of training delivery and its impact on teachers' work, if any. It was the last year the EE was taking place and that was my only and last chance to attend the training and observe its real conditions of delivery. At the same time, I could refine the questionnaire (See Appendix II), since I got feedback after ten teachers completed the initial version of it. The findings of the exploratory study are discussed later in Chapter 4.

The next stage was the main study, which lasted from December 2003 to December of 2004 and was conducted at three different times of the year in order to observe whether the impact of the training would have any variation. It is discussed below.

Towards the end of my research I carried out interviews (See Appendix III, IV, V and VI for interview schedules) with three persons that played a leading role in planning and implementing the three teacher ICT in-service training programmes, the 'Odysseia', the 'Preparing Teachers of the Information Society Programme' and the 'In-school Training in ICT Programme', in order to get a wider context and understand better the relevant issues. Although there were several people who contributed to the design and implementation of the ICT training programmes, those three people were regarded having leading roles in their area. The selected people were asked to give information about the initial design of the project in which each was involved, to evaluate the training system in general, in the context of a broad reform plan, to identify difficulties they met, to make suggestions for addressing difficulties they had perceived, and to mention any future plans. I was trying to investigate the perceptions, opinions and attitudes of the programme designers and the degree to which they took into account what international literature says about the

introduction of successful change and reform in schools. In that way, I would manage to acquire an extra dimension that would validate the results of my research.

	Profession	Role
Programme designer 1	Academic	Important role in the design of Odysseia and implementation of EE
Programme designer 2	Member of the Pedagogical Institute	Important role in design of TSC
Programme designer 3	Teacher-Trainer/ Ministry of Education	Co-opted to lead development of www.e-yliko.gr

Table 3.1: The role of the selected people in the training design and implementation

The chronological development of the research appears in the following table.

Date	Event	Source of information	Tools for acquiring information
I. Oct. 02/ Aug.03	Reviewing literature and preparation of research tools	Books, journals, documents of training design and implementation.	Searching in libraries and online. Consulting the contributors to the training.
II. Sept. 03	Exploratory study	Investigation of the available training programmes	Observations of TSC and EE training sessions Interviews with participant teachers. Informal interview with teacher-trainers.
III. Oct. 03	Main study: 1 st phase	12 teachers 6 head-teachers 3 teacher-trainers	Questionnaires Interviews Document collection
IV. Dec. 03	Main study 2 nd phase	15 teachers 3 head-teachers	Questionnaires Interviews Document Collection
V. Apr. 04	Main study 3 rd phase	13 teachers 6 head-teachers	Questionnaires Interviews Document Collection
VI. Dec. 04	Main study 4 th phase	2 teachers 3 programme designers	Interviews
VII. Jan. 05-Sept. 05	Analysis of the data		
VIII. Oct. 05-May 06	Writing up of the thesis		

Table 3.2: Chronological development of the research

3.3 Main Study

In 2003 in the wider area of Athens there were three teacher-trainers training 99 philology teachers coming from 56 schools. The training was taking place in six different schools (see Table 3.2). Five people, out of the 99 teachers who started the training, dropped out within the first month of the training. I had the opportunity to talk to two of these teachers and discuss the reasons why they dropped out. They found it quite difficult, because of the content of the EE training programme, or because they did not have enough free time since they were attending the TSC training programme as well.

Teacher-trainer 1	Teacher-trainer 2	Teacher-trainer 3
Teachers 42	Teachers 29	Teachers 28
Schools 18	Schools 21	Schools 17

Table 3.3: The training in numbers in 2003

All three teacher-trainers were either sent e-mails or were phoned and were asked to participate in the research. All agreed to participate. They initially sent me the details of the participants and other details of the training. I decided to choose randomly a number of 30-35 teachers (33% of the total population in Athens), acknowledging that it would be impossible for me to contact and involve in the research the whole population of teachers (99), under the time restrictions of my research. I was interested more in going into the depth of the sample than in its width. As regards the method of selection, I chose schools from a random list, every fifth school, aiming to obtain a sample of at least 33 teachers from those who attended the EE training programme from these schools. In a later stage, I

checked to see if the sample had become inadvertently weighted in any particular area. I realised that there were schools that had a large number of teachers who had participated in the training as well as schools that had one teacher who had taken part in the training from the whole school. That would give me the opportunity to compare the impact of the training on teachers who were the only ones in their schools attending the training and on teachers who were attending the training together with other colleagues. In the final part of the research I investigated the creation and function of informal communities of practice emerging from the training and their impact on ICT use.

On training and school level the population sample consisted of:

- three teacher-trainers, who were the total population of teacher-trainers in the sessions held in the wider area of Athens as regards the philologists,
- thirty four teachers who were serving in fifteen secondary schools
- nine head-teachers of these schools, since the rest of the head-teachers preferred not to participate in the research.

Miles and Huberman (1994, p. 34) put six questions against which to check qualitative sampling. They believe that the sampling in a research must: (i) be relevant to the researcher's conceptual framework and the questions s/he puts, (ii) provide the phenomena s/he is interested in, (iii) enhance generalisability, (iv) produce believable descriptions and explanations, true to real life, (v) be feasible in terms of time, money etc. as to its plan, and (vi) be ethical as to its plan. In formulating the sample of this particular case study I took care that the sampling was relevant to my own conceptual frame and research questions.

1 st phase	October 2003	
School 1	Group of 4 teachers	1 head-teacher
School 2	Group of 3 teachers	1 head-teacher
School 3	1 teacher	
School 4	Group of 2 teachers	1 head-teacher
School 5	1 teacher	1 head-teacher
School 6	1 teacher	1 head-teacher

2 nd phase	December 2003	
School 7	Group of 3 teachers	1 head-teacher
School 8	Group of 2 teachers	
School 9	Group of 3 teachers	1 head-teacher
School 10	Group of 4 teachers	1 head-teacher

3 rd phase	April 2004	
School 11	Group of 2 teachers (+2 that gave up)	
School 12	1 teacher	1 head-teacher
School 13	1 teacher	
School 14	1 teacher	
School 15	Group of 5 teachers	

Table 3.4: The sample in phases and schools

During the main study, the teacher-trainers, the teachers who participated in the EE training programme and their head-teachers were interviewed about the training experience, the utility of their training and the impact it had on their and their schools' life. The interviews took place during the first year after the training; the academic year 2003-

2004, at three different stages, and tried to investigate teachers' and their head-teachers' stance towards computers after finishing the training, whether they used computers or not, the reasons preventing or helping them to use computers in the classroom and their future needs.

3.3.1 The Selection of the Most Appropriate Method and Technique

An appropriate method is required in order to investigate the EE in-service training and explore its overall impact on the teaching and learning process. The researcher needs to choose the research design, the data needed, the sources, the methods and the techniques and the type of analysis of data that will fit the aim of the researcher (Gray, 2004, Easternby-Smith *et al.*, 1991; Robson, 1993).

Bryman (2004, p. 12) says that the choice of research methodology is determined by a set of factors. First, the belief of the researcher whether there is some sort of external truth out that needs to be discovered or whether her/his task is to explore and unpick people's multiple perspectives in natural settings; second, the way the researcher thinks theory should be used; and third, the researcher's decision to apply methods of the natural sciences to the study of social reality and to approach the problem in a deductive or an inductive process, that is to use a 'top down' theory driven approach, determining general categories in advance and moving to more specific, generating hypotheses through theory, or using a 'bottom up' data driven method, starting to code with specific categories and then moving to more general themes (Richards and Richards, 1994; Bryman, 2004).

Greene (1996) imagines that the researcher comes to the process of her/his study with no bias, no prejudice, no pre-conceived notions, no lens through which to view the phenomenon under consideration, and has what he calls a 'view from nowhere'. But at the same time he asks 'is it possible?'. He concludes that everything the researcher brings to the research process helps to form the lens through which s/he looks and that it is expected for the researcher to be influenced by her/his stance towards reality of life and its events.

Stott and Usher (1999), similarly, affirm that 'it is not the instrument that determines the strategy, but the way in which it is employed', giving an example that a questionnaire can be used in a way that can be considered qualitative (p. 92). Research, especially of social character, is influenced by the researcher's 'ontological' and 'epistemological' background (Bryman, 2004, p. 21).

Ontology has to do with the nature of social entities and deals with issues such as whether the social world is regarded as something external to social actors or as something that people are in the process of fashioning (Bryman, 2004, p. 4). It is related (i) to 'objectivism' that asserts that social phenomena and their meanings have an existence that is independent of social actors and (ii) to 'constructivism' which maintains that social phenomena and their meanings are continually being accomplished and constantly revised by social actors (Bryman, 2004, p. 17). Epistemology, on the other side, is concerned with the way knowledge can be acquired and communicated to other human beings, deals with the problem of the appropriate knowledge about the social world and whether a natural

science model of the research process suits the study of social world (Bryman, 2004; Gray, 2004).

Hitchcock and Hughes (1995) distinguish a reciprocal relationship between ontology and epistemology and suggest that ontological assumptions give rise to epistemological assumptions and these, in turn, give rise to methodological considerations, which, in turn, give rise to issues of instrumentation and data collection. Accordingly, research methods are not simply a technical exercise, but are closely connected to ontology and epistemology. It is suggested by Stott and Usher (2003, p. 93) ‘the epistemological and ontological relations within whom the researcher is positioned drive the choice of strategy and method’.

Cohen and Manion (1996) sustain the view that the methods of research someone chooses depends significantly on the stance s/he has towards this knowledge. They say that:

The view that knowledge is hard, objective and tangible will demand from researchers an observer’s role... to see knowledge as personal, subjective and unique, however, imposes on researchers an involvement with their subjects and a rejection of the ways of natural scientist.

(p. 6)

To subscribe to the former is to be ‘positivist’, to subscribe to the latter is to be ‘anti-positivist’ or ‘interpretivist’ (Cohen and Manion, 1996, p. 6; Silverman, 2001, pp. 83-115), which means that the strategy used requires social scientists to grasp the subjective meaning of social action (Bryman, 2004, p. 13).

According to Manstead and Semin (1988, p. 40) case studies are appropriate for exploratory work and include observation, interview and documentary analysis. Punch (1998, p. 151) asserts that ‘the general objective of a case study is to develop full understanding of a particular case as possible’ and to ‘focus holistically on that case aiming to preserve and understand the wholeness and unity of the case’. To succeed in this aim it can employ qualitative and quantitative approaches and use as methods design, data collection and data analysis. Yin (1994) adds that:

A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when boundaries between phenomenon and context are not clearly evident. It relies on multiple sources of evidence, with data needing to converge in a triangulating fashion. Case study is not a data collection or merely a design feature alone but a comprehensive research strategy.

(p. 13)

Accordingly, a case could be an evaluative study which describes, interprets, explores, explains what is happening, seeks new insights, asks questions, assesses phenomena in a new light, a process usually but not necessarily qualitative (Manstead and Semin, 1988; Robson, 1993; Bassegy, 1999).

This study could be characterised as a case study, in that it aims to develop detailed and intensive knowledge about a small number of related cases. This is a multiple case study with embedded units of analysis, under the logic of replication, which means that the cases were chosen because they were thought to have either similar traits or opposite ones (Yin, 1994). Although, I began with the idea of multiple cases, in the process I viewed it as a

single case-study, since the smaller cases had similar characteristics. The central aim of my research is to explore teachers' reactions to the ICT in-service training they received and the reasons why they tried or did not try to implement this innovation into their every-day practice after finishing this training. This study is especially interested in investigating the way teachers grasp and perceive their environment and the way they communicate their knowledge. It aims to 'explore subjects and issues where relationships may be ambiguous or uncertain' to 'attribute casual relationships' and not simply to describe a situation (Gray, 2004, p. 124). So using elements from the evaluative process it tries to be (i) comprehensive, as to the range of data it collects about the problem which is analyzed, (ii) systematic, as to the techniques it employs in collecting these data, (iii) objective, as to impartiality in the way that it looks at these data, and (iv) reliable, as to the degree it substantiates and validates the subsequent judgments (Southworth and Conner, 1999).

This educational study also has an obvious social character and so social science research methods should be mostly employed. Since social reality is constructed and interpreted by people rather than existing objectively, it aims to explore teachers' perspectives of events. This is especially appropriate in the educational area 'where the immense complexity of human nature and the elusive and intangible quality of social phenomena contrast strikingly with the order and regularity of the natural world' and makes interpretivist approach appear more appropriate and more effective (Cohen and Manion, 1996, p. 10). This leads the researcher to be driven towards ethnographic approaches of participants' observations and interviews (Cohen and Manion, 1996, p. 7).

3.3.2 Combination of Qualitative and Quantitative Methods

Following my own epistemological and ontological consumptions, which intuitively pushed me to the constructionism and the interpretivist approach, I decided to use a combination of qualitative and quantitative methods. This combination seems to correspond to Merton and Kendall's (1946) observation that social scientists have reached the point of abandoning the false dichotomy between qualitative and quantitative data and are simply interested in the combination of both research types, which could most exploit the advantages of each type.

It is true that some researchers regard the combination of these tools and these methods as inappropriate (Stott and Usher, 1999), however Gall *et al.* (1996, p. 32) support the conventionality of the parallel use of qualitative and quantitative methods in the research and Bryman (2004) underlines that 'there is a growing preparedness to think of research as techniques of data collection or analysis that are not as encumbered by epistemological and ontological baggage as sometimes supposed' (p. 463) and states that:

When researchers combine observation with questionnaire, they are not combining qualitative and quantitative research, since paradigms are incommensurable - that is they are incompatible - and that the integration is only at a superficial level and within a single paradigm.

(p.453)

He finally notes that we should think of the relationships between these methods and strategies as 'tendencies rather than as hard-and-fast distinctions' (p. 13).

Twining (2002) observes that the disagreement between researchers about combining qualitative and quantitative research methods ‘is due to the ambiguity about the level of research that was being discussed and at which paradigmatic labels should be applied’ and adds that confusion increases because of different terminologies used within literature (p. 40-42). He believes that the distance between authors becomes smaller if there is agreement on the level of discussion and the terminology used. Twining’s terms and their relationships, which are adopted in this study, appear in the following diagram.

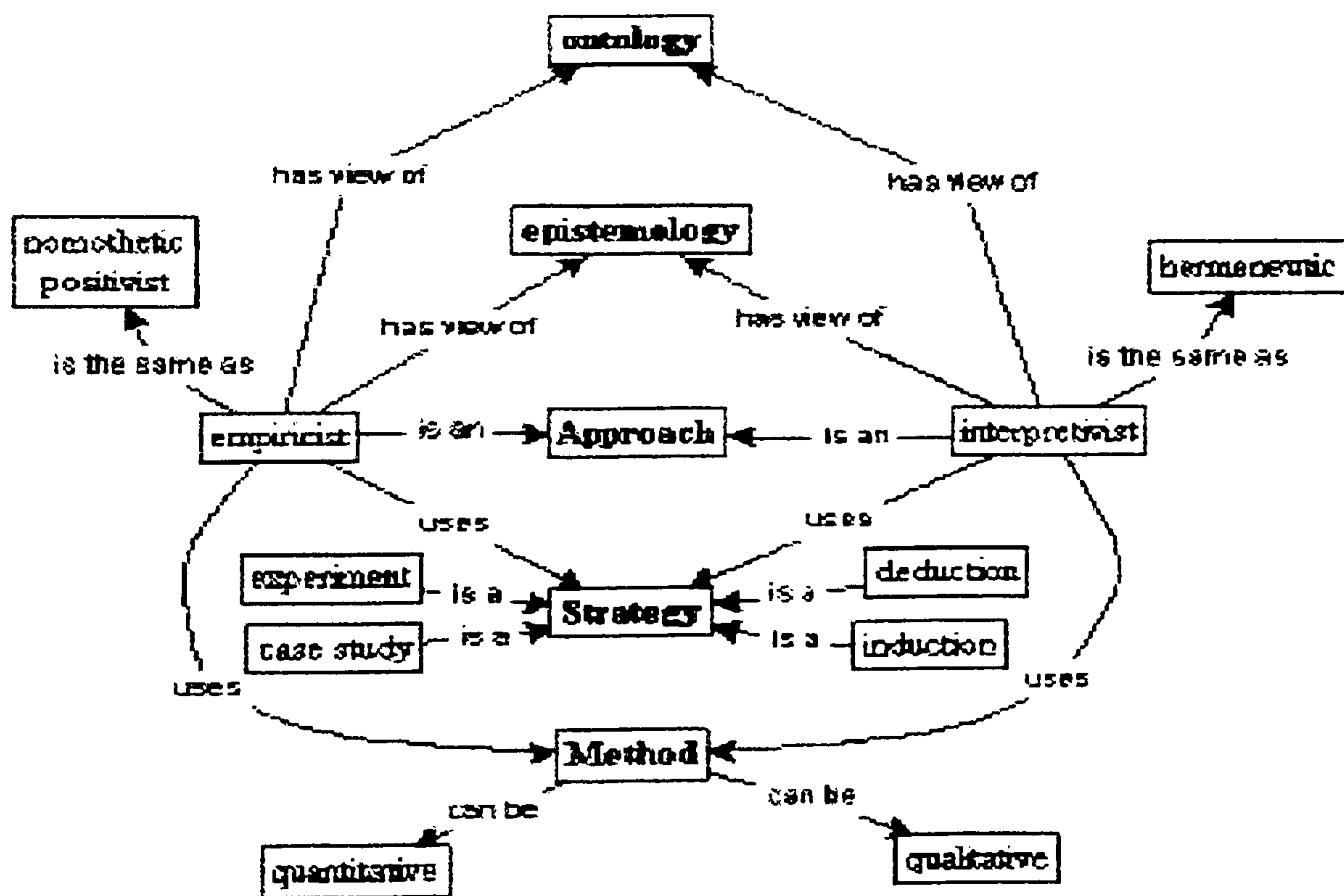


Figure 2.1: Twining’s terminology

Bryman (2004) likewise suggests that the differences between qualitative and quantitative research should not be overrated and, quoting Silverman (1984), points out that some quantification of findings from qualitative research can lead to generalisation of the

phenomena under investigation and marks the ways qualitative and quantitative research could be combined and fused. He notes that:

The results of an investigation employing a method associated with one research strategy are cross-checked against the results of using a method associated with the other research strategy (logic of triangulation).

(pp. 454-461)

Where quantitative research tends to bring out a static picture of social life, qualitative research is more progressive; when data from a quantitative research are confusing, a qualitative research method may illuminate the puzzle and solve the problem. The combination of the two types of research can help the study of different aspects of a phenomenon. Qualitative data allow researchers and participants to gain access to the perspectives of the people they are studying, while quantitative data allow them to explore specific issues they are interested in. Qualitative research provides hypotheses and aids measurement and can facilitate quantitative research. It can also fill the gaps that quantitative research may present and facilitate the interpretation of the relationship between variables. Quantitative research facilitates qualitative research through the selection and identification of people to be interviewed and sometimes solves the problem of generality.

Similarly, Miles and Huberman (1994, p. 42) maintain that qualitative and quantitative research methods are linked at three levels: (i) the 'quantising' level, where qualitative information can be either counted directly or converted into ranks and scales, (ii) the overall study design level, where multi-method approaches are employed, and (iii) the

linkage between distinct data types level, where qualitative information is compared with numerical data. The same opinion is supported by Merton and Kendall (1946) who say that:

Social scientists have come to abandon the spurious choice between qualitative and quantitative data: they are concerned rather with the combination of both which makes use of the most valuable features of each. The problem becomes one of determining at which points they should adopt the one, and at which the other approach.

(p.45)

Gray (2004) notes that a research project usually includes a lot of different research questions that cannot be answered through a single research method. A 'triangulation approach' can be used, which is a combination of methods for collecting data from different sources over different times (Easternby-Smith *et al.*, 1991). Robson (1993) too asserts that the selection of the research strategy or techniques should be made on the basis of the research questions and that 'the differences between the two traditions can be best viewed as technical rather than epistemological, enabling the enquirer to 'mix and match' methods according to what best fits a particular study' (p. 38).

Hammersley (1993, p. 456) likewise suggests that there are false dichotomies which 'if dissolved would render the distinction between qualitative and quantitative research redundant' and adds that 'data collection processes, which do not involve quantification, will have to be employed to fully understand the nature of the social world' (p. 91).

According to Hammersley (1993, p. 456) researchers can fuse and combine qualitative and quantitative research methods, because (i) the use of one research method may corroborate

the findings of other (triangulation), (ii) the employment of one research strategy may aid the other strategy to carry out its aims, and (iii) the use of the two strategies can dovetail different aspects of an investigation.

3.3.3 The Chosen Methods and Techniques

For carrying out the present case study I had to plan a research design, which would provide a framework for the data collection and analysis. The selection of the methods used in this research derives from the belief that the naturalistic orientation of qualitative research has particular benefits for social policy studies, because of its capacity to reflect the subjective reality of those people who are the targets for policy decisions (Bassey, 1999, p. 167).

A triangulated methodology has been used: literature review, document analysis, surveying, questionnaire, interviewing and observation, which are the commonly used techniques for data collection in a case study (Robson, 1993). Any finding or conclusion in a case study is likely to be much more convincing and accurate and increases the construct validity, if it is based on several sources of information (Yin, 1994), while the quantitative data from the questionnaires can offer some qualification, helping the audience to get a clearer view of the data playing a complementary role. The logic of triangulation permits the findings from one type of study to be checked towards the findings deriving from the other type and so enhances the validity of the findings (Miles and Huberman, 1994).

The particular strategy of triangulation, although it is almost universally accepted by the scientific community, is rarely employed. Bryman (2004) supports the multi-strategy research, saying that it might provide the researcher with a full understanding of the events under examination that could be difficult or impossible, if just one method had been used, and assure her/him of the reliability of her/his findings providing her/him with the chance to access the events from different perspectives. In contrast, the selection of a single research method could lead to a false picture of the reality and its misinterpretation (Anderson, 1990).

This case study employs a variety of data collection methods such as one to one interviews, tape-recorded or not, lesson observation, questionnaires, document collection:

I. Questionnaires

In spite of some disadvantages related to their structure (Lavaw, 1980; DeVaus, 1986), their distribution (Belson, 1986) and the quantity and quality of the information given, this tool is the most frequently used by researchers. It has the advantage that it can reach a potentially large number of respondents, give the specific information and feedback needed, and provide both qualitative and quantitative data (Busher and Harris, 2000 cited in Harris, 2002, p. 48). As Cohen and Manion (2000, p. 245) say it provides 'structured often numerical data being able to be administered without the pressure of the researcher and often being comparatively straightforward to analyse'. When the questionnaires are structured and used properly, they can give useful and important quantitative and qualitative details and present the attitudes of the subjects towards specific questions

providing the researcher with the opportunity of obtaining a large quantity of data in relatively straightforward way.

I used a questionnaire to acquire information from the teachers who attended the specific EE ICT in-service training for a number of reasons namely 'it provides a valid measure of the research questions, gets the cooperation of the respondents and elicits accurate information' (Robson, 1993, p. 242).

For this purpose I visited the schools, met the teachers and gave them the questionnaire (see Appendix III). At the same time I asked them for an appointment, as soon as possible, in a day, which suited them best, to have an interview with them and to return to me the questionnaire they were previously given. That method was very successful, since I got a 100% response regarding the questionnaires.

The questionnaire used was the same during the three phases of the research to allow comparisons between the three groups of teachers. It was divided into three sections according to the broad areas of inquiry that were identified from the review of relevant literature and the exploratory study. A first draft of the questionnaire was given and feedback was taken from the participants in order to create a final version. Section A asks from the participants general personal information related to their gender, age, studies, years of teaching and subject, level of education in ICT (duration, source and type), use of computer for personal purposes and for preparation and execution of their school job. Section B asks for information relevant to the particular ICT in-service training in which they participated. Section C asks them information relevant to their beliefs about the role

computers can play in the improvement of schools and teachers themselves, when used in the teaching and learning process. All the items are presented in a Likert-type scale with five response options (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree) ranging from one (low level) to five (high level).

The teachers did not appear to have serious difficulties in filling in the questionnaire, although they sometimes seemed that they did not fully understand some of the specialised ICT and pedagogical vocabulary, and some questions required explanation.

The questionnaires were written in Greek and translated in English right from the beginning. The translated form is used for the report of the data and its analysis.

II. Interviews

Interviewing was chosen as the primary method of data collection and as a tool to define variables in a multi-method research (Caplow, 1972). Stott and Usher (2003, p. 98) say that interviews serve a range of purposes such as (i) to allow access to situations where the researcher cannot be present or where access permission is refused to her/him, (ii) to allow cross-checking against data collected from different sources and understanding of patterns within social life, where the emphasis is on the reliability of the collected data. Simultaneously, interviews give interviewers the opportunity to frame and re-frame the questions so that they can be more certain that they are understood in the same way by all the respondents. According to Kerlinger (1970) interviews may be used to explore unexpected results or to evaluate other methods or to examine the interviewees' motives

and the reasons for which they responded in the way they did. Semi-structured interviews have been selected in order to provide the interviewees with the scope to fully explain their stance and to raise issues they regarded important, and so enabled me to probe comments of importance or lacking clarity, as it allows interviewees freedom to respond as they see fit (Powney and Watts, 1987).

An approach was devised whereby a number of broader themes were identified, and a series of standard trigger questions related to each theme was formulated. An approach was employed similar to 'Interview Guide Approach' described by Patton (1980) suggesting the preparation of a list of issues or questions to ensure that the same or appropriate information is obtained from each interview. The trigger questions related to each area were carefully worded to encourage teachers to speak about specific issues, but at the same time they allowed them to drift in and out of various areas of inquiry as they saw relevant. Before commencement of interviews the basic questions were discussed with experienced researchers who were asked to comment on the suitability of the questions and their potential to elicit responses relevant to the areas of inquiry and the overall aims of the research. After the comments the necessary changes and adjustments were made.

The interviews served another purpose: they raised issues that were perhaps unclear in the questionnaire, and so bring to light aspects that would not be investigated by a questionnaire. According to Pring's (2000, p. 39) statement that 'If you believe that the significance or the meaning of what is done lies in the ideas, intentions, values and beliefs of the agent, then those ideas, etc. have to be taken into account'.

I had intended to tape-record and to fully transcribe each interview, so that all information was included and nothing omitted or forgotten. Powney and Watts (1987) suggest that tape-recording should be introduced early in the discussion, even before the proper interview starts and mentions that people easily get used to being tape-recorded and they are encouraged to give their best performance. However, tape-recording may play an inhibitive role and restrain some individuals from giving some kinds of personal information (Busher and Harris, 2000, cited in Harris 2002, p. 48).

Of the sample, eight teachers preferred not to be recorded. In these cases, I had to keep notes during the interview and to add further details afterwards. The disadvantage was that this may have potentially resulted in the loss of valuable material, but the notes provided in-depth, quick and easy production of information (Busher and Harris, 2000 cited in Harris, 2002, p. 48). In the event I was able to produce detailed accounts of these eight interviews but not complete records as with these I had tape-recorded.

The advantages of recording and transcribing of interviews are also emphasised by Bryman (2004, p.330), while Atkinson and Heritage (1984, p. 238) suggest that this (i) helps researcher to correct the natural limitations of her/his memory, (ii) allows her/him to revise the conversations as many times s/he thinks it is necessary, (iii) makes possible the option of examining the content of the data and of checking out that the analysis is not biased and (iv) gives the researcher the opportunity to use the data in other ways and for other reasons different from the initial ones.

The interview schedule changed during the three stages of the research process. Each time, after the transcription and the analysis of the interviews, new elements were included in the schedule. The last schedule seemed to be more effective and covered issues that had not been mentioned earlier and in addition to that, it seemed to prompt the teachers talk more. The intention was to obtain rich and detailed answers with strong interest in interviewees' opinion. Interviewing ought to be flexible and it was adjusted to respond to the direction in which interviewees took the interview following the 'semi-structured' type (Bryman, 2004, p. 319).

The interview was conducted one to one, in the participating person's school, or office, and it was of half to one-hour duration. I always took care to initially relax the interviewee and built some kind of rapport prior to and during the interaction. I took care to put the relevant questions in an appropriate and tactful way. I was careful to employ Robson's (1993, p. 232) guidelines that I should: (i) listen more than speak, (ii) put questions in a straight, clear and friendly way, (iii) eliminate cues which led interviewees to respond in a particular way and (iv) enjoy the interview, and the basic principles of phrasing of questions put by Downs *et al.* (1980) and by Sudan and Bradburn (1982). There were only two teachers that refused to be interviewed because they had personal reasons to be upset with the teacher-trainer (see Analysis Chapter). As mentioned before there were also 6 head-teachers that did not participate in the research, because they said they were busy. I could not force any of the teachers or head-teachers to have an interview with me, since that would be against my ethical guidelines.

In this particular research, I was at the respondents' disposal. They could access me any time while filling in the questionnaires in order to ask questions. They were also given the opportunity to interrupt the sequence of the interview and were free to mention anything they found relevant to the topic, even though this proved to be a quite time-consuming procedure. I asked the same questions in different ways, in the questionnaire and during the interview, a process that offered a solid base for the comprehension of the following questions and their validity. The fact that the interview had a pre-organised structure with pre-created questions and was conducted face to face, worked for the reliability of the results.

The interview included closed as well as open-ended questions. The latter kind of questions allowed the interviewees to express their opinions openly and in depth. Oppenheim (1966, p.77) sees this as adding to validity and mentions the 'snap answer', that is the interviewees' first immediate reaction to the question, which reveals, what is uppermost in their mind rather than a carefully considered statement. In this research, both kinds of questions were posed, sometimes for the same item, to double check the validity of the answers. On the other hand, the fact that the interviews in each school were conducted on the same day meant there was not a prior exchange of opinions between teachers and thus I secured a greater degree of independent opinion.

In general, the interview, whether tape-recorded or not, provided me with a rich source of relevant information.

III. Observation

In using this tool I took care to follow all those requirements which are regarded necessary for an effective observation, according to the literature (Harris, 2002, pp. 107-108), that is (i) to make transparent the aims of the observation process from the outset, (ii) to simply note what appeared to me to be important or relevant to the purposes I set, (iii) to decide the exact purpose of the observation and focus upon those teaching skills and techniques and models that are central to the teaching repertoires with computers or the knowledge acquired through the ICT teachers' training in question.

This technique is time consuming and has a subjective character, but it is appropriate for looking at teacher/student or teacher-trainer/teacher relationships or interaction into classroom or into computer suites and reveals the characteristics of a group or of individuals that could not be easily obtained by another means (Busher and Harris, 2000, cited in Harris, 2002, p. 48). Observation was regarded necessary, because it enabled me to investigate the processes of the teacher training and the teaching by the trained teachers including their use of ICT. It is also offered an intimate picture of the reality, as it gave me the possibility to enter directly into the world of my subject of interest.

Hopkins (1993) distinguishes three types of classroom observation: open, in which the observer simply notes what seems to her/him to be important or relevant, focused, in which the observer has predetermined the foci of observation and is based on pre-existing categories for recording information, and structured, in which the observer has decided the

focus of the observation such as teaching skills, approaches and models that are central to the teaching repertoire, and has discussed it with the person observed.

I knew that, in spite of the well-established benefits of observation, teachers would be reluctant to accept an observer in their classroom. I knew also that professional learning arises from building partnerships with other teachers (Fullan and Hargreaves, 1992). I therefore tried to create in advance a mutual trust between myself and the teachers, who were to teach their pupils with the use of ICT. The observation of these teachers was to be focused on the way they would use and exploit ICT and whether this use would be effective. So a combination of all three types of observation referred to above was to be employed. At the same time, I intended to assess whether the teachers' schools had sufficient ICT resources and ICT policy, in order to allow teachers to make use of their knowledge and abilities, to shed light in the way teachers transferred their instruction to their pupils and to underline features that were deriving from the training.

Although this was my initial plan, during the year the research was conducted none of the above teachers was using the school's IT suites. I kept asking the teachers who had tried to use the computer suite the previous year to allow me to attend a teaching incorporating ICT, but even those teachers had no opportunities to try any teaching that year. So, the observation was limited to the TSC and EE training sessions during the pilot/exploratory study.

IV. Document collection

Documents from the training centres such as training programmes and specific targets, teachers' personal teaching archives concerning their use of ICT and their schools' ICT policy (individual level) were collected and analysed. Software and a website with suggestions for lessons with ICT use at www.e-yliko.gr which was created during the Odysseia project (see Chapter 5) were also investigated. The website enabled teachers to upload plans of lessons with ICT for various subjects and contained news concerning ICT use in education. Initially the teacher-trainers were responsible for this website, the content and its maintenance, but its nature changed over time.

The description of the content of the programme was also supported through trainers' lesson plans sent to me after their interviews by email. Based on these, I had the opportunity to understand the content of the training. The archives were extremely helpful since I did not have the opportunity to observe many training sessions. A sample of the lesson plans along with the description of the content of the EE programme is presented in Appendix IX.

3.3.4 Ethical Considerations

The case study raised some ethical issues. Since teachers would be observed, while teaching or being taught, issues of appropriateness, accuracy and professionalism would be brought to the surface. In addition, government designed programmes would be put 'on the spot' and this might restrain some people from expressing their opinions openly. I felt it

important to reserve the anonymity and confidentiality of personal data and the identity of the informants by not including any identifying information in the thesis.

Although access to the schools initially appeared to be easy, in reality it was problematic. In line with the centralised Greek educational system to conduct research, a researcher has previously to get official written permission from the Ministry of Education. This proved to be very time consuming: the relevant permission was finally obtained in the middle of the academic year 2003-2004. Until then, I was getting permission for access to schools and teachers from the head-teachers of the schools, who proved to be quite open-minded. But in fact, I felt confident in my research only when I got the official permission from the Greek Ministry of Education. The head-teachers were welcoming and appeared willing to co-operate. None of them hesitated, in spite of the strong restrictions put by the Ministry of Education on them, to allow me to talk to the teachers without waiting for the official Ministry of Education permission, on the grounds that teachers are adults and they could decide for themselves. Almost all the teachers were ready to participate in the research, as long as it would not be time-consuming and would not disorientate them from their teaching duties. Looking back, I did not carry out research that would affect classroom teaching or the pupils in any way.

To successfully resolve ethical questions I tried from the very beginning of the study to establish good and friendly relations with the participants and to develop a sense of rapport with them leading to a mutual feeling of trust and confidence (Cohen and Manion, 1994, p. 67). I followed the two principles offered by Strike (1990, pp. 68-69) on the ethics of

educational evaluation, that is (i) of 'benefit maximisation', that holds that the best decision is that which results in the greatest benefit for most people and (ii) of 'equal respect', according to which the researcher respects equally the worth of all people.

Additionally, I followed the five principles of an ethical research as presented by Lindsay (Seminar on ethics, April 2004, Warwick University):

- That the researcher's approach to theory data and analysis is open to external scrutiny;
- That what is being said is intelligible meaningful and authentic;
- That the context of what is being said is true, backed by strong weight of evidence;
- That the researcher is justified in what s/he is saying;
- That the research is independent and speaking sincerely.

3.4 Chapter Summary

In this chapter I discussed the main key issues regarding the selection of the appropriate research methods and tools for addressing the research questions presented in Chapter 1. Issues of ontology, epistemology and the combination of qualitative and quantitative methods were put on the spot. A case study approach was chosen using a combination of tools such as questionnaires, interviews and few observations. The aim of this combination was to go into depth into the perspectives of the participants and to acquire a better understanding of the conditions under which the training took place and of the impact it had on teachers' practice. The next chapter refers to the methods of analysis that were utilised.

CHAPTER 4: METHODS OF ANALYSIS

4.1 Introduction

In this chapter I discuss the methods used for the analysis of the data, which were collected through the observations, the questionnaires, the interviews, the literature review and the document search.

4.2 The Methods of Analysis

Bryman (2004, p. 22) writes that an important activity in the process of any social research is analysis of data. This analysis, which is ‘the process of breaking the data down into smaller units to reveal their characteristics, elements and structures’, determines the interpretation of data and defines the relevant conclusions. According to Yin (1994, pp. 112-113) there are two methods of analysing the evidence:

- a. ‘Relying on theoretical propositions’. This helps the researcher to focus attention on certain data and ignore other, to make choices between what is worth investigating and what should be rejected, to organise the whole case-study, to compare and contrast her/his data with what the theoretical models have predicted and to define alternative explanations to be examined.
- b. ‘Thinking about rival explanations and developing a case description’. This is concerned with drawing a picture of what happened, or of how things are proceeding, or of what a

situation or a person or an event is like, while explanation tries to find the reasons that link together things, events, situations and to show how and why something has come to be what it is.

Likewise, Robson (1993) identifies three general strategies for data analysis relying:

- a. On theoretical propositions, indicating where and on what the researcher should focus his/her attention.
- b. On a descriptive framework, making the researcher look for a set of themes or areas linked to the research questions, which appear to give an adequate coverage of the case.
- c. On chronologies, assisting the researcher to determine casual relationships and to organise data from a case study over time.

Theory and data are closely interrelated and imply a reciprocal relationship with each other. Gray (2004, p. 5) defines theory as a set of interrelated concepts, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining and predicting phenomena. Thus, theory development prior to data collection is an essential step in case studies. Theory and the rival theory will sequentially cover the questions, propositions, units of analysis, logic connecting data to propositions, and criteria for interpreting the findings (Yin, 1994, p. 28). From this point of view theory development does not only facilitate the data collection phase of the ensuing case study, but it also, appropriately developed, is the level at which the generalisation of the case study results will take place. Yin (1994, p. 30) characterised

this role of theory as 'analytic generalisation' and he contrasted it with the other way of generalizing results, known as 'statistical generalisation'.

The method of analysis of the data collected in this particular case study was not straightforward. I looked deeply into the literature to develop an understanding of the elements of effective or successful ICT training programme for teachers. This sensitised me to elements grouped under the planning for change, implementing the training, implementation of ICT in teaching and the evaluation of the impact of the training as outlined in Chapter 2.

This was followed by a pilot study which is explained in Chapter 3 and brief comments from this study are included below:

I. From the observation of the Preparing Teachers of the Information Society Programme (TSC).

During this step of the research I realised that, although teachers had different needs, these were not simply associated with their subject specialism or their IT skills. For example, a key characteristic of some of the teachers I spoke to, was that they had many years of experience and some of them were going to retire soon. They felt they had no strong reason for attending that course. The teachers were paid in order to participate and they would be paid further on presentation of a receipt for a computer they had bought. This resulted in an increased number of teachers who were willing to attend the training. On the other hand, there was the suspicion from teacher-trainers and teachers as well that many of

the people participating in the programme were simply interested in the money and not in the training.

The two teacher-trainers whose sessions I attended had different teaching methods. The first one was quite friendly to the teachers, but that did not seem that had a positive result especially in the case of inexperienced teachers. The second teacher-trainer was more formal, but the teachers appeared to progress. In both training sessions there was a teacher-trainer's assistant. In one of them, the assistant's role was absolutely invisible, while the other assistant was indeed helping the teachers.

The teacher-trainers seemed to have a sense of disappointment and uncertainty about their work. They expressed the opinion of being helpless, unguided (the day seminar was the first time they met the teachers) and they were doubtful about the results of the training and its future. They did not seem to be confident with ICT use, especially those who were inexperienced. That was very worrying, considering that the training was reaching its end.

II. From the observation of the In-school Training in ICT Programme (E.E.)

The teacher-trainers were teachers of Greek Language and Literature and of History and had attended a post-graduate course to become teacher-trainers in the context of 'Odysseia'. The teachers who attended the training sessions were teachers of the same specialism with various IT skills and they had volunteered to attend the course as a group from their school. There was no grant given to them.

Although the teachers had started from different levels of ICT skills and different needs, at the end of the session nobody could distinguish the difference. They were all interested in what they were learning and they were all confident in using the computers.

Everything was taught in a specific context. Even the IT skills were taught with a particular purpose. The training appeared to have a focus on theoretical aspects of teaching methods, not only for ICT use. According to the teachers' statements the major obstacles to the success of the training seemed to be the time of the training (three-six in the afternoon), after working at school, which appeared to be inappropriate, and the technical problems with the network or viruses that the teacher-trainer could not solve by himself.

The main findings confirmed the value of the framework and highlighted specific issues to look at in the main study, such as the issue of differentiation, that of teacher motivation and the nature and scope of the training. Especially this observation brought in my mind some categories and helped me to organise my data around them.

During the main study my framework for analysis was refined by selecting, focusing, simplifying, abstracting and transforming the data appearing in notes or transcriptions, to find themes and to create categories (Miles and Huberman, 1994, p. 208). This was done through the techniques of 'coding' and 'memoing' suggested by Miles and Huberman (1994, p. 206). Coding is the 'concrete activity of labelling data which gets the data analysis under way and which continues throughout the analysis' (Miles and Huberman, 1994, p. 206), while memoing is the 'theorising write-up of ideas about codes and their relationships as they strike the analyst while coding' (Glaser, 1978, quoted in Miles and

Huberman, 1994, p. 207). These techniques do not simply provide a description, but also move towards the creation of a theory.

A first step in the coding process was the preparation of the 30 small categories, such as Trial lessons, use of ICT by students, Time, Reasons for use, e-yliko, Motivation and others (see Appendix VII). These were very helpful in order to develop a first categorisation. All the interviews were coded according to these categories. A different colour or a different format was used for each code throughout the interviews (see Appendix VIII).

It soon appeared that there were often overlaps. At that point I started making memos and combined the categories in fewer but more comprehensive categories. The five guidelines suggested by Robson (1993, p. 382) for coding were used for this purpose, that is:

- Try to discover genuine categories and give them a name;
- Relate categories in the context they occur;
- Relate them to each other always on the basis of specific data;
- Develop core categories;
- Discard unrelated categories unless you find a way of linking them to the core;

The fact that the data had to be translated made this task more complicated. I was consistent in the selection of wording and eventually I was able to proceed to the coding, which was done in English. It was difficult sometimes to translate expressions, which have

particular meaning in Greek. However, being a native Greek speaker, I managed to grasp these expressions and effectively translate them into English.

Eventually the above categories were reduced to the following, organised within the perspectives of teachers, head-teachers, teacher-trainers, programme designers:

a. Perceptions of the teachers: 1. Characteristics and motivation, 2. The perceptions of the EE training program, 2.1 The training structure and teaching methods used, 2.2 Lessons incorporating ICT, 2.3 Further training, 3. The characteristics of the teacher-trainer, 4. The schools characteristics, 4.1 Access to ICT resources, 4.1.1 Problems relevant to the computer use and implications, 4.1.2 Problems related to the lack of appropriate infrastructure, 4.2 Lack of time 4.3 Lack of pressure and support, 4.4 The demands of the curriculum, 5. Perception of impact of the training 5.1 At a personal level, 5.2 At school level.

b. Perceptions of the head-teachers: 1. Information about the head-teachers', 2. Head-teachers' perceptions about the educational potential of ICT, 3. The impact of EE ICT training, 4. Factors that make teachers avoid using ICT in subject teaching, 4.1. Lack of the appropriate infrastructure, 4.2 Lack of time, 4.3 Lack of support, 4.4 The demands of the curriculum, 4.5 The general culture of the Greek school, 5. Perceptions about teachers' motivation, 6. Suggestions regarding improving the training.

c. Perceptions of the teacher-trainers: 1. Teacher-trainers' perceptions about the educational potential of ICT 2. The process of teacher-trainers' preparation and their own

training, 3. The carrying out of the in-service training, 3.1 Problems related to its preparation, 3.1.1 The attitudes of head-teachers, 3.1.2 The attitude of teachers, 3.2 Problems related to carrying out the training programme, 3.2.1 Lack of access to the computer suite and of appropriate infrastructure, 3.2.2 Lack of support, 3.2.2.1 Issues with IT teachers 3.2.2.2 Head-teachers' attitudes, 3.2.2.3 Issues with the Ministry, 3.2.3 The nature of the teachers 3.2.4. Lack of an appropriate curriculum and timetable, 3.2.5. The differentiation of knowledge and skills of the teachers, 4. The evaluation of the EE ICT training program and its impact on the school's life, 5. The teacher-trainers' suggestions regarding for the training's improvement.

d. Perceptions of EE programme designers: 1. Programme designers' position towards the in-service training, 2. The impact of the training programmes, 3. Programme designers' conceptions about the problems related to carrying out the programme realisation, 4. Programme designers' suggestions for good practice in ICT in-service training.

There are two commonly reported approaches to coding; a bottom up, data driven method, where the researcher builds up hierarchical categories by starting with specific categories then thinking about more general ones which link specific categories together. The other approach is a top down, theory driven approach, where general categories are determined in advance and the purpose of the research is to test out a hypothesis and to show whether the categories apply and are elucidated in the data. In this case study, a mixed method was used, since I did start with some theoretical propositions and categories taken from the literature, but I did create new categories as they emerged from the data, starting from the

pilot study and continually checking the appropriateness of each theme as the data were examined. I was open to what people were saying and how this could be recorded. The existence of the interviews transcriptions was very helpful, in that I could refer repeatedly to the actual text and examine it from a different perspective each time.

4.3 The Method of Reporting

To analyse the collected data and present them I used the method of description and explanation. Robson (1993) presents this method as a general strategy for analysis on a descriptive framework and says

looking for a set of themes or areas, linked to the research questions again, which appear to give an adequate coverage of the case. It is working towards an issues analysis, where the issues can be a means of organising and selecting material (p. 378).

Yin (1999) also agrees with the use of a descriptive analysis, which according to him is an 'original objective' (p. 112), and underlines that:

Better case studies are the ones in which the explanations have reflected some theoretically significant propositions; making an initial theoretical statement or an initial proposition, comparing the findings of the initial case against such a statement or proposition, revising the statement, comparing other details of the case against the revision, comparing the revision to the facts of a second, third or more cases repeating this process as many times as needed.

(p. 120)

This process is presented as the appropriate one for explanation building.

I started with the belief that cases (schools) would provide particular data based on those teachers in school who attended the training or the particular teacher-trainer. However it emerged that take up was low in all schools and I was presented with a general phenomenon, which seemed to hold across three schools. My focus shifted from the particular to the general while recognizing exceptional cases. For these reasons I decided to present data from the different schools together, though in a later section, I present two scenarios (within the case) of teachers who were different in their practice and underline the reasons why they stood out among their colleagues.

The last issue that troubled me was the way the questionnaires would be reported and how they would help the analysis of the interviews. The questionnaires largely covered topics, which had been covered in the interviews but sometimes not. I felt, given the large overlap, that it was more coherent, to report both survey data and interview data together and do this around the themes I had identified earlier.

The analysis of data was made qualitatively, but as it was mentioned in the methodology chapter, that did not prohibit quantification of results. The questionnaires were analysed with simple statistics. SPSS was used in order to help me analyse the questionnaires. This was decided simply because it offered me the easy display of data and not because the number of questionnaires demanded it. In trying to give a quantitative sense of the strength of a finding, I decided that it would be better to use raw numbers, where relevant rather than percentages as they would interrupt the flow of the text and they would tire the reader. At various points I have quantified findings, with words to express breadth of agreement:

A few	For numbers $\leq 20\%$
Some	For numbers $> 20\%$ and $\leq 33\%$
Less than half	For numbers $> 33\%$ and $\leq 50\%$
More than half	For numbers $> 50\%$ and $\leq 66\%$
Most	For numbers $> 66\%$ and $\leq 80\%$
Nearly all	For numbers $> 80\%$

Table 4.1: Explanation of expression of quantified findings

For example ‘Most teachers felt that ICT use has some positive results in learning’ means that between 66 and 80% of the teachers who answered a specific question in the questionnaire, or responding to a theme in the interview, agreed or strongly agreed that ICT has some positive results in learning.

4.4 Generalisability

It is assumed that any research intends to generate socially useful knowledge. One of the major criticisms of the case-study approach is that it cannot claim a great degree of generalisation, although Gray (2004, p. 31) supports that generalisability is less important than understanding the real working behind reality. There can be a kind of generalisation occurring from the case study approach, defined either as ‘fuzzy generalisation’-‘it is possible, or likely, or unlikely that what was found in the singularity will be found in similar situations elsewhere’ (Bassegy, 1999, p. 12, 2001) or as ‘analytic generalisation’, in which a previously developed theory is used as a template with which to compare the empirical results of the case study. Although Hammersley (2001) questions this distinction

and says that it is not clear that ‘fuzzy’ generalisation refers to a distinct kind of generalisation it is generally accepted that if two or more cases seem to support the same theory, replication may be claimed (Yin, 1994, p. 31).

It is natural that all researchers wish that their research would and could be generalised in wider settings than that from which its data were originally collected. Of course, this is not always possible. I do not believe that my findings would necessarily be representative of the total population of Greek teachers who took part in the teacher ICT in-service training programmes throughout Greece and even more for the total number of teachers who attended ICT in-service training all over the world. However, similar elements as described in this study can be seen in many different training programmes and in this sense the findings of the study could be generalised.

4.5 Reliability and Validity

According to Robson (1993, p. 66) validity is concerned with the degree the findings of a research are really about what they appear to be about, while reliability is ‘the extent to which a test produces similar results under constant conditions on all occasions’ (Bell, 1997, p.64). Bryman (2004, p.28) distinguishes four types of validity: (i) the measurement validity, whether a measure that is devised of a concept does really reflect the concept that it is supposed to be denoting, (ii) internal validity, whether a conclusion that incorporates casual relationship between two or more variables holds water, (iii) external validity, that has to do with the question of whether the results of the study can be generalised beyond

the specific research context and (iv) the ecological validity, whether social scientific findings are applicable to people's everyday, natural social settings .

Lack of reliability may have various causes such as subject errors (tiredness), subject bias or observer bias. If a measure is not reliable, it cannot be valid. One solution to this problem is to stay as close as possible 'at the level of what is measured or observed, and do not attempt to go beyond this to some theoretical construct' and another to recognise that any way of measuring or collecting data is likely to have its shortcomings and so to take multi-method approach (Robson, 1993, p.69). Oppenheim (1966, p.72) likewise maintains that 'the best safeguard is said to be good rapport, so that the respondent becomes willing and eager to give information that is really accurate' and adds (1992, p. 147) that keeping the same wording, procedure and sequence reveals that the interviewer is posing the same questions to all respondents and presents a measure for validation of whether the findings are 'really' about what they appear to be about. He further says that the findings of research are valid, when they are similar to findings of other research (1966, p. 77). This applies mostly to areas, which are well explored, as is the area of this specific research. In case of differences it is not possible to verify which one is more valid.

4.6 Chapter Summary

In this chapter, some of the issues underlying methods of analysis were presented and the framework for analysis of the data was described. A mixed method of analysis was chosen, with predefined categories, which were checked throughout research stages, and other

categories that would emerge from the data. Description and explanation building methods of reporting employed, using quantification of some data so that the reader would have a perception of the case in numbers. The modelling of the results and their locating in the literature are discussed in later chapters. The next chapter presents the results from the exploratory and the main study.

CHAPTER 5: TEACHERS' PERCEPTIONS OF THE TRAINING

5.1 Introduction

This chapter begins the presentation of the data that refer to the teachers' characteristics and their perceptions of their motivation, the training structure and content, the characteristics of the teacher-trainer, the school and the school's culture and the programme's impact.

5.2 Teachers' Characteristics and Motivation

Nearly all the teachers who participated in the research were women and most of them were aged 40-49 years old. All of them had University degrees, but most of them had not any post-graduate degree. Most of them had 16-25 years of teaching experience, but no previous ICT experience, although nearly all had computers at home. Most of them had volunteered to attend the training because they wanted to acquire IT skills.

More specifically, 34 teachers, four male and 30 female, coming from 15 different low level and high level secondary schools of the wider area of Athens attended the training. Of these teachers six were aged 30-39, 22 were aged 40-49 and the rest, six, were 50-59 years old.

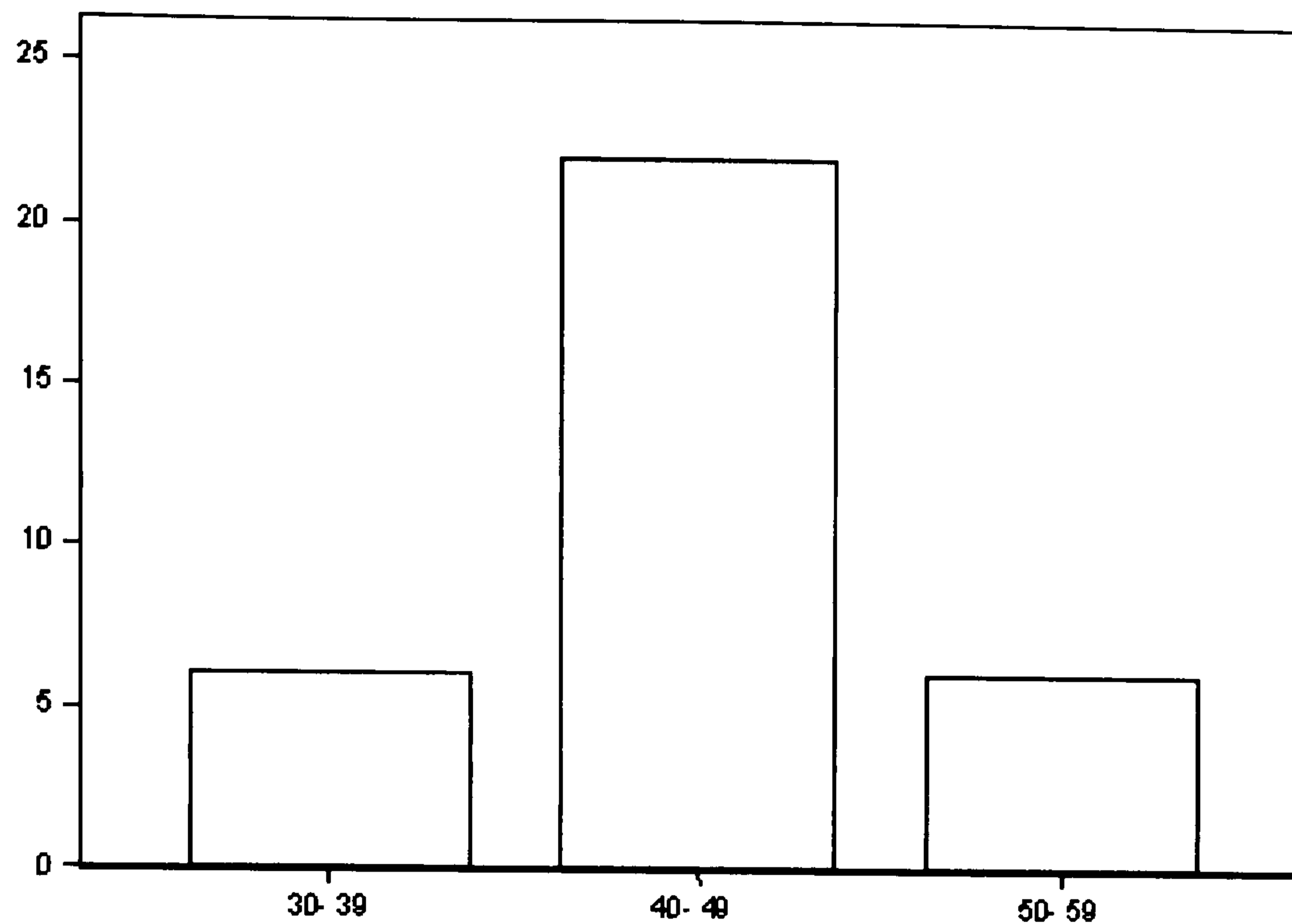


Figure 5.1: Age profile of teachers

All the teachers had University degrees, but as far as it concerns their further education, only two teachers had taken one year's training on education, one had got a Master Degree in UK and another two had attended training, although not on ICT (no post-graduate award is necessary in order to become teacher in Greece). At the time they were questioned 13 teachers were teaching mostly ancient Greek Language and Literature, seven mostly History, five mostly modern Greek Language and Literature and 1 was teaching Latin. Eight teachers did not fill the relevant part of this questionnaire.

The teachers differed in terms of the level and the years they were teaching. Three teachers had a less than ten years teaching experience, six were teaching for 11-15 years, 11 for 16-20 years, another 11 for 21-25 years and, finally, three teachers had a more than 26 years teaching experience. Of the 34 teachers 15 teachers, two males and 13 females, were

serving in low level and 19, three male and 16 female, were serving in high level secondary schools.

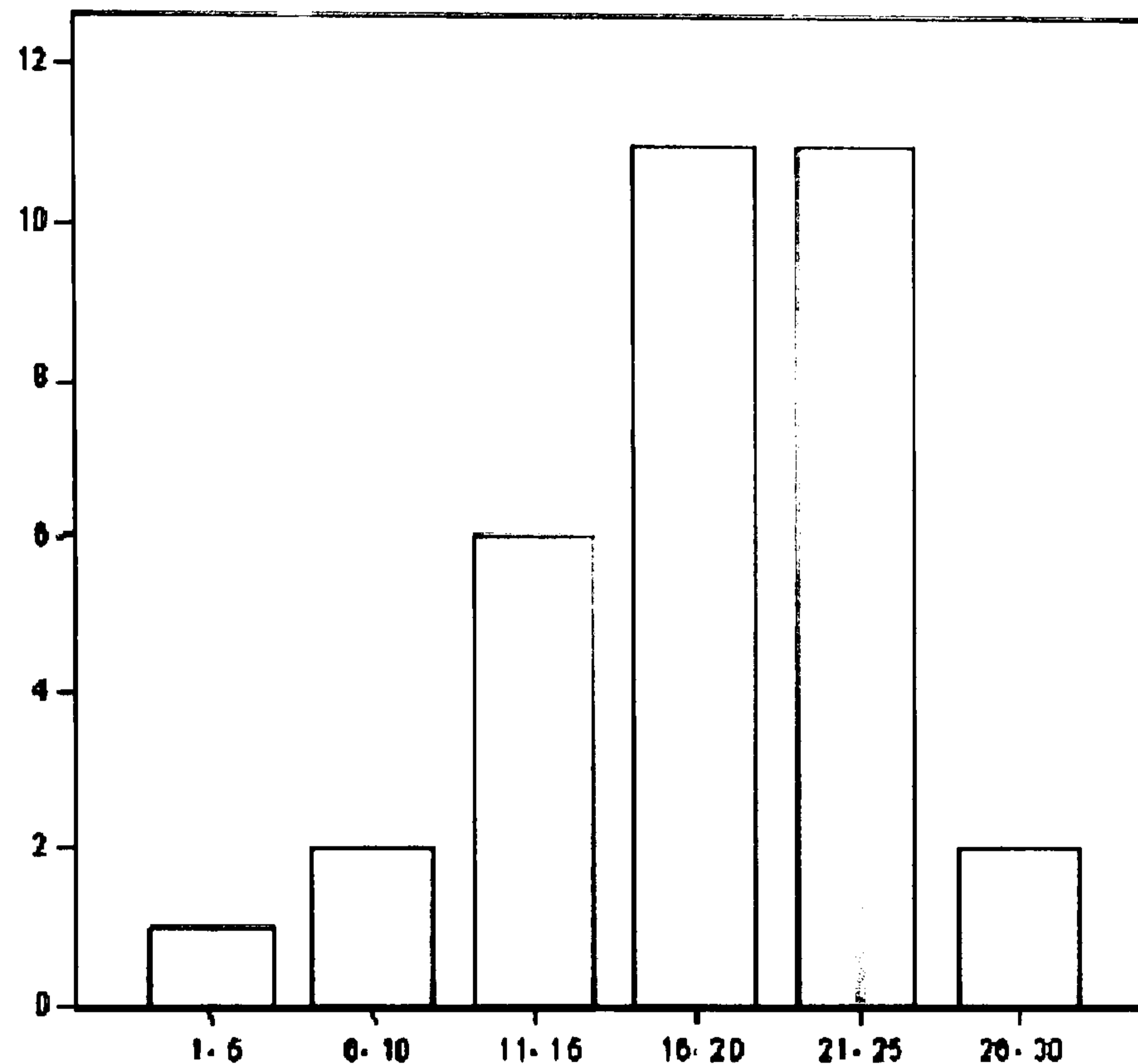


Figure 5.2: Years of teaching experience

As regards teachers' previous experience with ICT training, 23 out of 34 were found to have no previous ICT experience, three of them had some ICT experience before entering the EE ICT training programme, three had attended seminars from a different educational body and five of them had been given advice and guidance by family members or friends. At the same time 26 teachers noted that they did not feel confident in using computers before attending this training, while the rest, eight, said that they were confident users of computers.

Teachers had different levels of ICT access: two teachers had a computer at home for less than two months, nine of them for two months to one year, eight of them two to three years, another eight for four to eight years and five had a computer at home for more than eight years. Two teachers had not a computer at home at all. In addition, 23 teachers had Internet connection at home, while the rest 11 said that they had not. Some of these, 11, mentioned that it was very expensive for them to afford an Internet connection and it seemed that at least some of them did not know that they had the right to have a free Internet connection (See Chapter 1).

18 of the teachers with computers at home used them for purposes not connected to their school work, 23 thought that having a computer at home was not essential for them to use ICT in their teaching, only four perceived it as essential, while 6 were not sure about it.

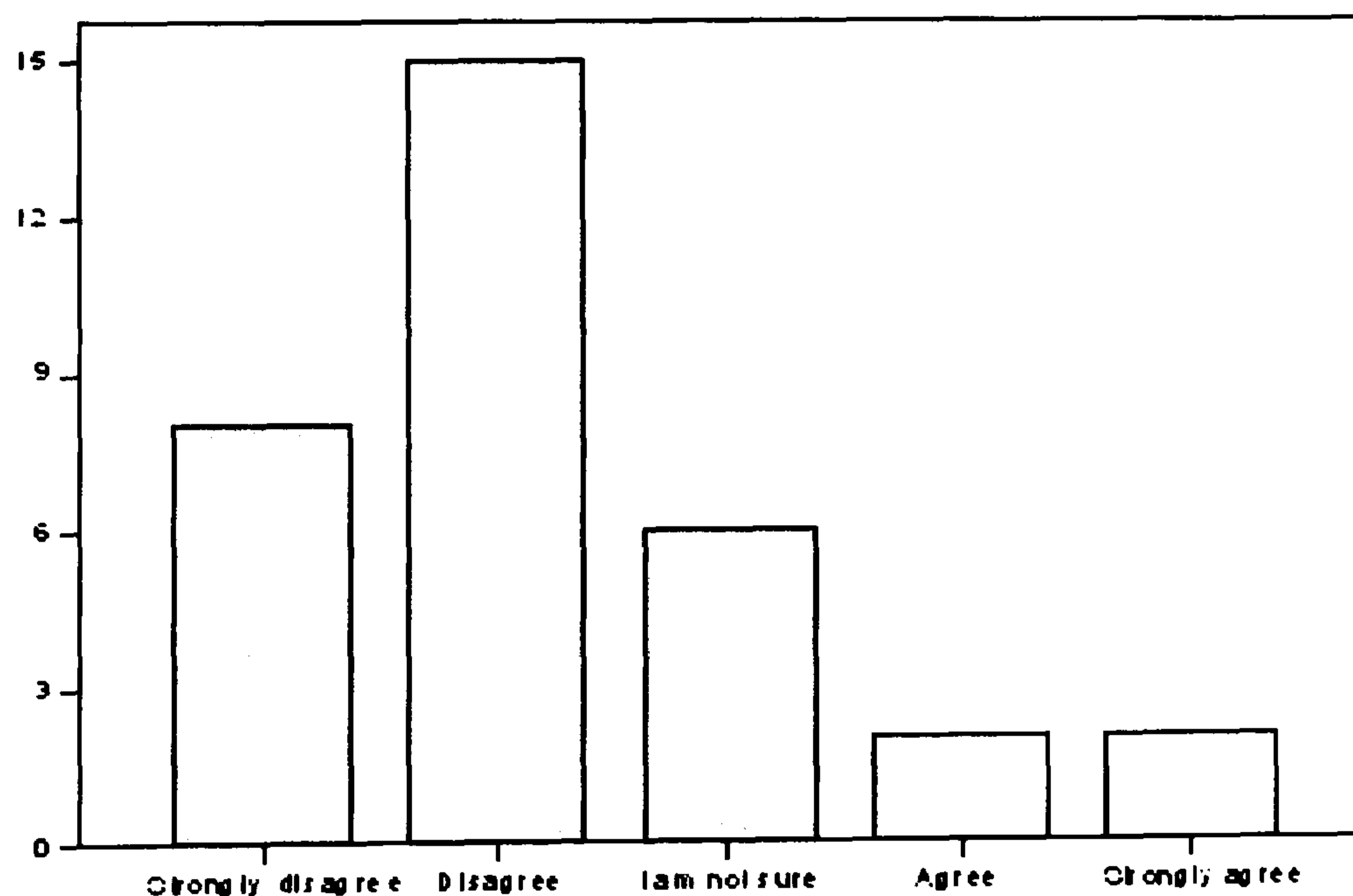


Figure 5.3: The proportion of teachers who considered that computer at home was not essential for them to use ICT in school

Concerning their motivation, some teachers explained that they were working for their own professional development and, of course, hoping to have a positive impact on pupils.

The lessons will be carried out in the future only with the use of computers and I didn't want to be without the relevant experience and knowledge.

(Teacher 9)

Most of the teachers had volunteered to participate in the EE ICT training programme, since they did not have the chance to take part in the TSC programme. A little less than half of the teachers did not have a clear aim of using the training to impact directly to their subject teaching. At least that was not their initial goal.

The TSC training programme offered participating teachers an amount of money and enabled them to buy a portable computer or to upgrade the computer they already had. On the other hand, teachers attending EE in-service training program did not have any financial incentive.

A matter closely related to the willingness of teachers to participate in training activities was the feedback - praise, reward or recognition - given to the participating teachers. Some of the teachers complained of not receiving any recognition for having completed the training or for participating in it. Training could only count if they 'decide to become head-teachers or to obtain a superior position' (Teacher 6).

Most of them, 26, agreed that they had not lost their motivation to attend the training during the year, only five felt that they had lost their motivation and two were not sure.

5.3 Perceptions of the EE Training Programme

Most teachers seemed to be quite satisfied with the training's content and structure. In general, most teachers were satisfied with the length of the training since they had a vast amount of material to cover. Some of the teachers felt that their differentiated IT skills were not dealt with appropriately, most of them would have preferred more examples of lessons related to their teaching subject and all of them would have appreciated more hands on activities. Concerning the lessons incorporating ICT that the teachers were expected to carry out in order to acquire the certificate of attendance (see 5.3.2), some teachers did these with the help of their teacher-trainer during the training and considered it to be positive for pupils learning and their teaching in general. The preparation of the trial lessons took them around five-six hours and these were mostly focusing on revision of what the pupils had already been taught. Most of the teachers felt that further training would be very useful in their work and they would be interested in it. In contrast, some teachers felt this would be unnecessary.

Those teachers who had no previous ICT knowledge were highly motivated by developing their skills and knowledge.

I am satisfied with the programme. For me... who was afraid to touch the computer, at least now I can touch it!

(Teacher 12)

Most of the teachers, 23 in total, felt that the results of ICT use justified the financial cost of the training, eight teachers were not sure and only two seemed to believe that the cost was not justified by the results.

Some seemed not to be ready to evaluate or assess the in-service training they received. They said that 'you have to wait for long time in order to evaluate this programme... you need too much time to be able to work' (Teacher 16).

5.3.1 The Training Structure and the Teaching Methods Used

As regards the structure nine teachers complained about the timetable. Training once a week for three hours after school hours, for 40-50 hours in total, appeared to be quite tiring and at the same time it did not help them to assimilate the relevant knowledge. They suggested that twice per week training could be more effective, since the relevant material was too huge and the knowledge presented each time had to be revised. A teacher explained:

I think each time we should start from a base. A base of revision, to help us to move on from what we had learnt already.

(Teacher 1)

But the findings of the study showed that more than half of the respondents, more specifically 20, seemed to agree that the one year's duration of the training was not long enough, four teachers said that they were not sure about this and nine thought of it as too long.

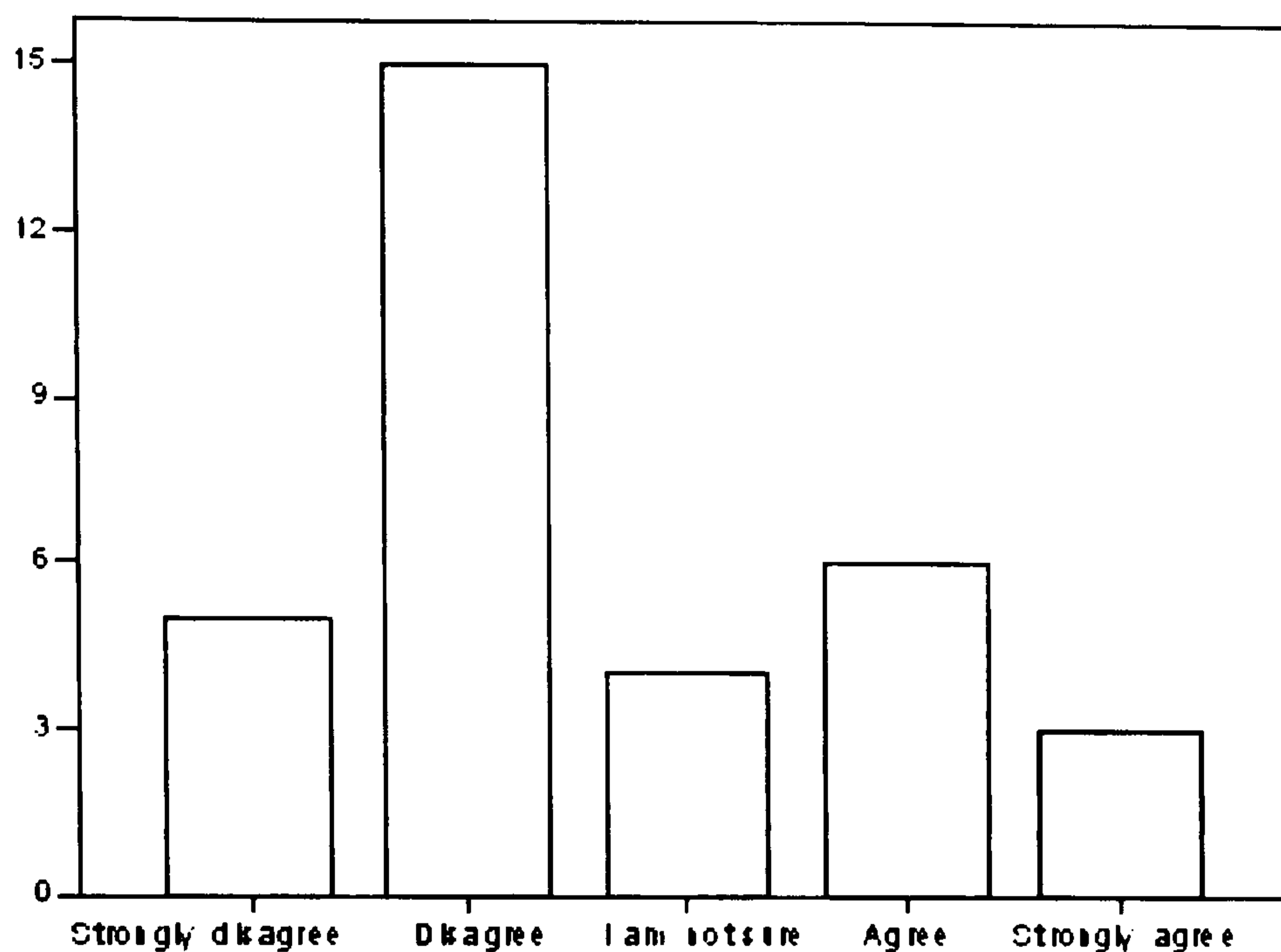


Figure 5.4: The proportion of teachers who thought that the training programme was too long

As regards the question whether the material was considered too much to cover in the time available nine teachers disagreed, 16 teachers agreed, while five seemed not to be sure.

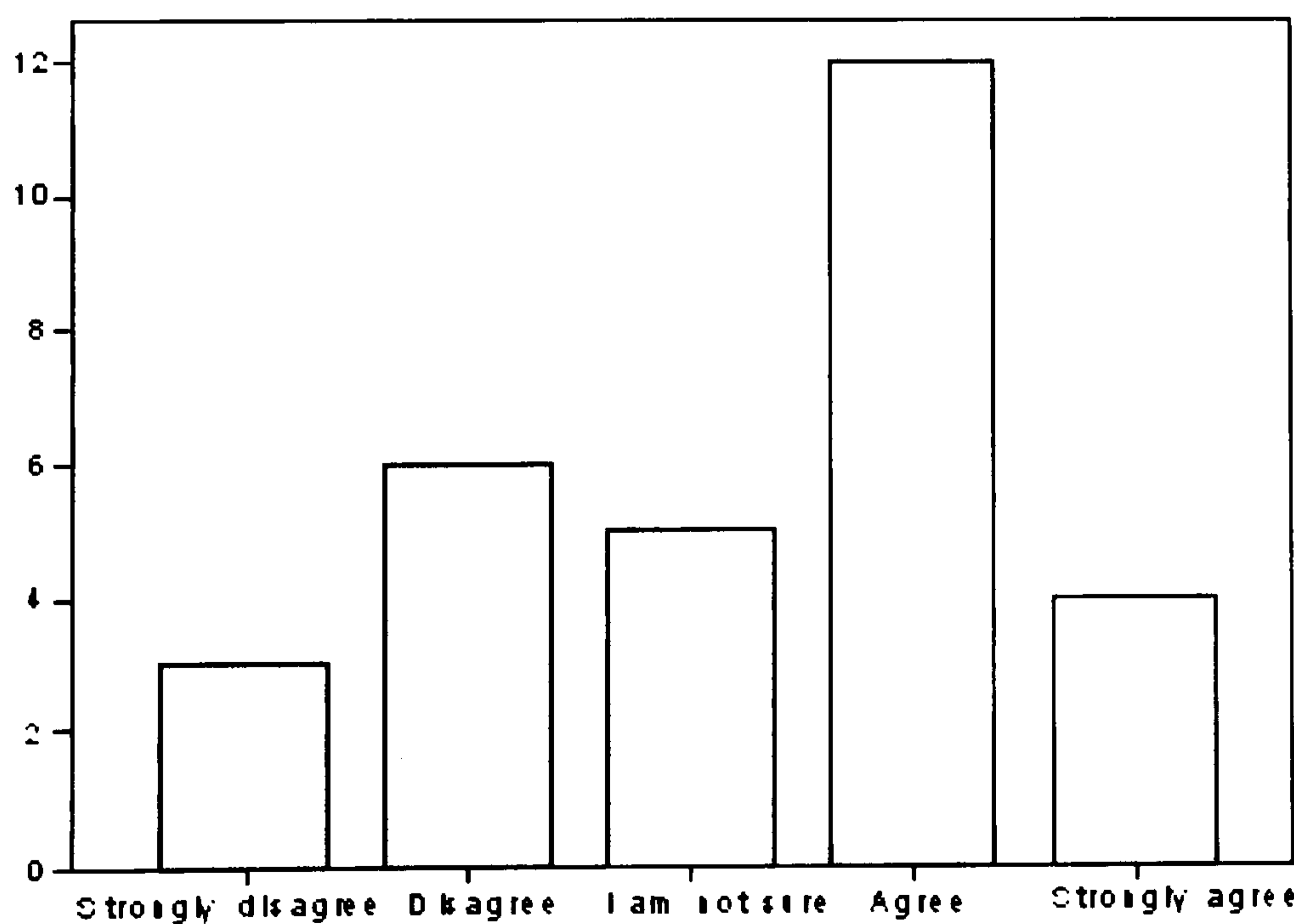


Figure 5.5: The proportion of teachers who thought that too much material was covered

Some teachers were attending the TSC programme at the same time as the EE training at least for a period of time. They suggested that it was too difficult for them to attend ICT training five days per week. One of them specifically felt that she did not have the time to learn and apply what she was being taught. In addition, some teachers, who were attending the TSC programme, found the EE programme repetitive and tedious at some points. One teacher who decided to leave the training said:

It could be one integrated programme. Because our teacher-trainer knew that there were teachers completely illiterate, he started almost from the beginning and focused on the teaching of the basic ICT skills.

(Teacher 12)

Some teachers found the pace of the training too fast, because they had no previous ICT skills or experience, and 'could not learn with that pace' and they would like their 'own pace' (Teacher 9). Some less experienced teachers suggested that the ICT skills training should precede the training on educational applications of ICT.

Another teacher expressed her worries concerning the different levels of IT skills possessed by her colleagues and the lack of differentiation in teaching during the training sessions. She felt that:

A differentiated teaching approach would be useful in such an environment of people with different IT knowledge and skills, with some technical problems, with the demands of the school curriculum and with other eventual problems.

(Teacher 10)

Some teachers added that there was lack of necessary feedback on their performance. Less than half of them, more specifically 15, reported that they received feedback, 11 said that they had not received it, while two were not sure. The lack of appropriate feedback made many teachers unsure of their progress though opinions were divided as to how successfully they were completing set tasks.

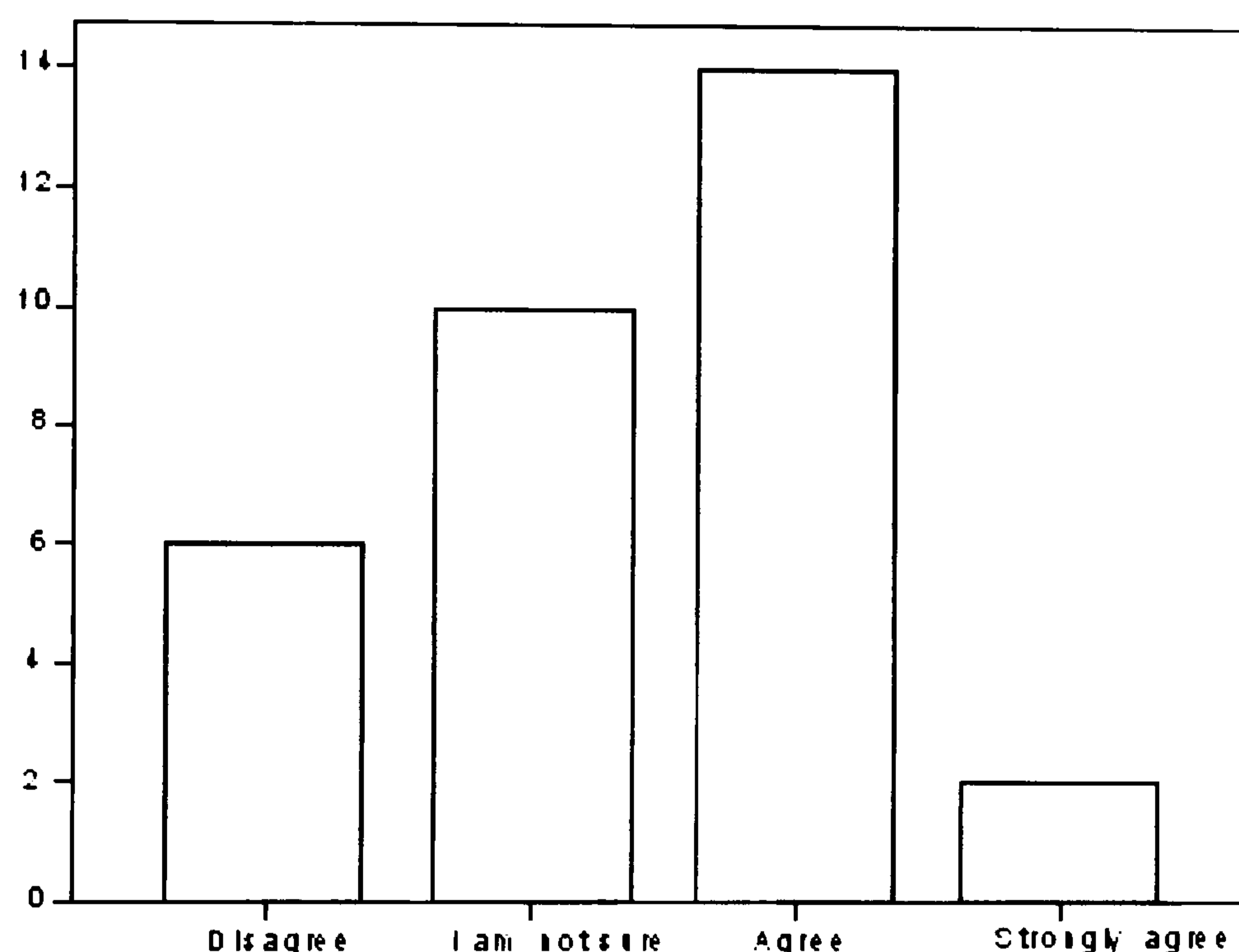


Figure 5.6: The proportion of teachers who thought that they were successfully completing tasks

Teachers felt that this lack of feedback on their performance was due to their indifference to the tasks they were asked to do or to the teacher-trainers who 'did not correct the work' (Teacher 1). This meant that some teachers lacked the necessary confidence to use their new knowledge in their teaching, since they did not know if it 'could work in a classroom or it was meeting the teacher-trainer's expectations' (Teacher 1).

During the training the teachers were provided with lesson plans of other teachers or teacher-trainers, but they suggested that it would be more important and useful, if they were asked to prepare a schedule for teaching with ICT by themselves, in co-operation with each other, so that they could familiarise themselves with the process. That was sometimes suggested, but did not always seem to work:

The teacher-trainer had told us to choose a chapter and produce something through cooperation, but we rejected it... It did not work and in fact the responsibility was clearly ours.

(Teacher 12)

In some cases teachers referred to the competitive environment created by the different experience and the different IT skills that teachers possessed:

Most participants were quite aged people and they had a complex with technology. They tried to show that they felt easy and confident with IT.

(Teacher 9)

Most of the teachers considered it a disadvantage of the training that they were not able to observe any teaching with the use of ICT in real teaching conditions, 'because there was a pressure at the end of the training, since it was the end of the academic year' (Teacher 4). The training was finishing at the end of the academic year when the teachers had extra work for the final exams. The same teacher suggested that it 'would be very helpful before you do your teaching to see how another person does it' (Teacher 4).

Most of the teachers, 24 in total, would have liked more examples related to their subjects of how to use ICT in the classroom. Only four of the teachers were satisfied with the examples used, while five were not sure.

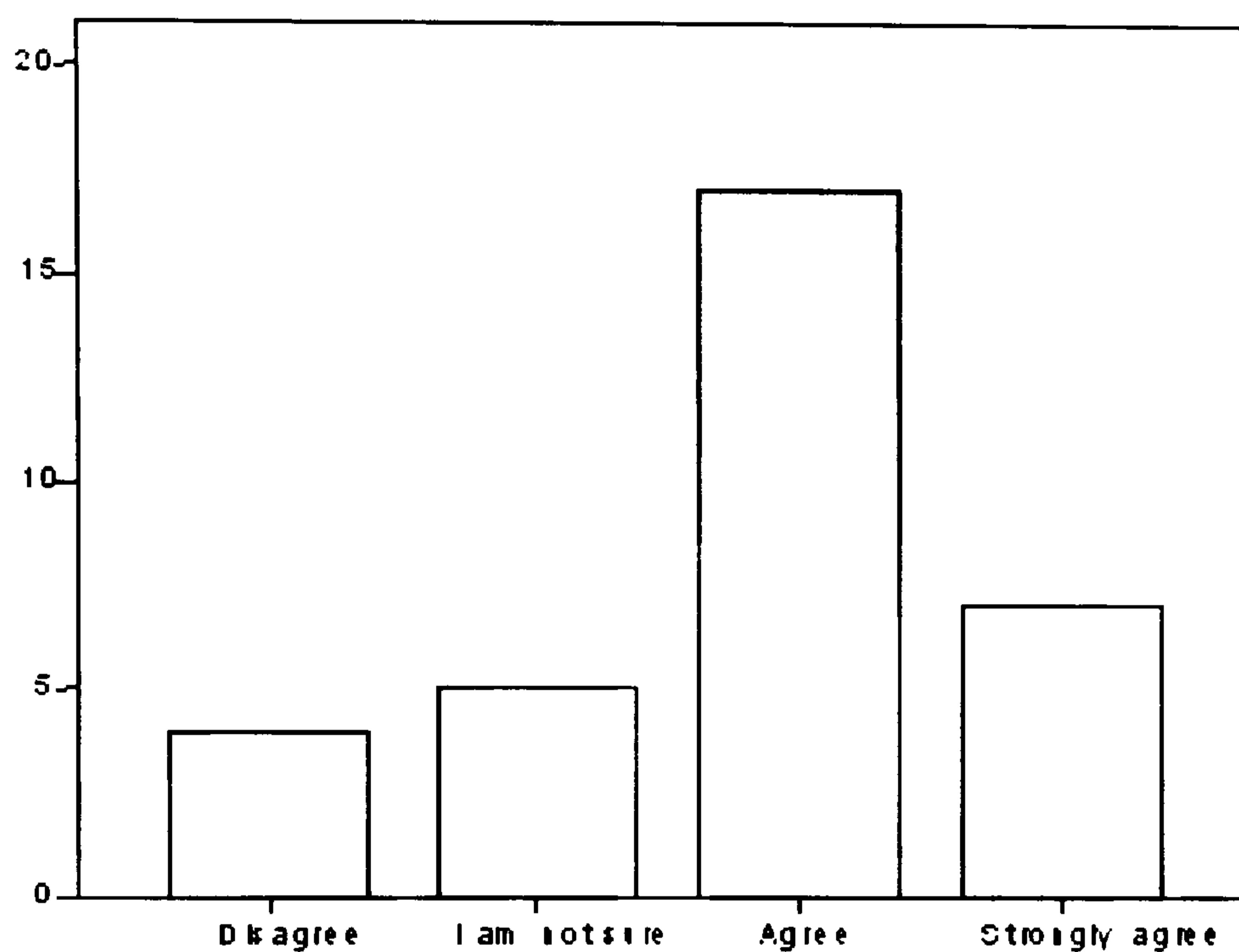


Figure 5.7: The proportion of teachers who thought that there was a need for more examples of ICT use in the classroom

More than half of the teachers felt that the training should not have provided them with information on teaching methods on the grounds that they were experienced teachers who had, as one noted 'no need of something like that', and added that she 'would like to be helped in making use of new software in practice without removing from the theoretical background' they already had (Teacher 4).

A more critical issue was that nearly all of the teachers felt that during their training they did not have many opportunities for hands-on activities, and that was another factor that made them feel unconfident. One said that she 'would like to share out the time equally on

theory and practice and not just before the end of the training to say: let's switch on the computers now' (Teacher 4).

20 teachers in total agreed that they had not been offered many opportunities for practising ICT use in school's computer suite, while nine disagreed and four appeared not sure about that.

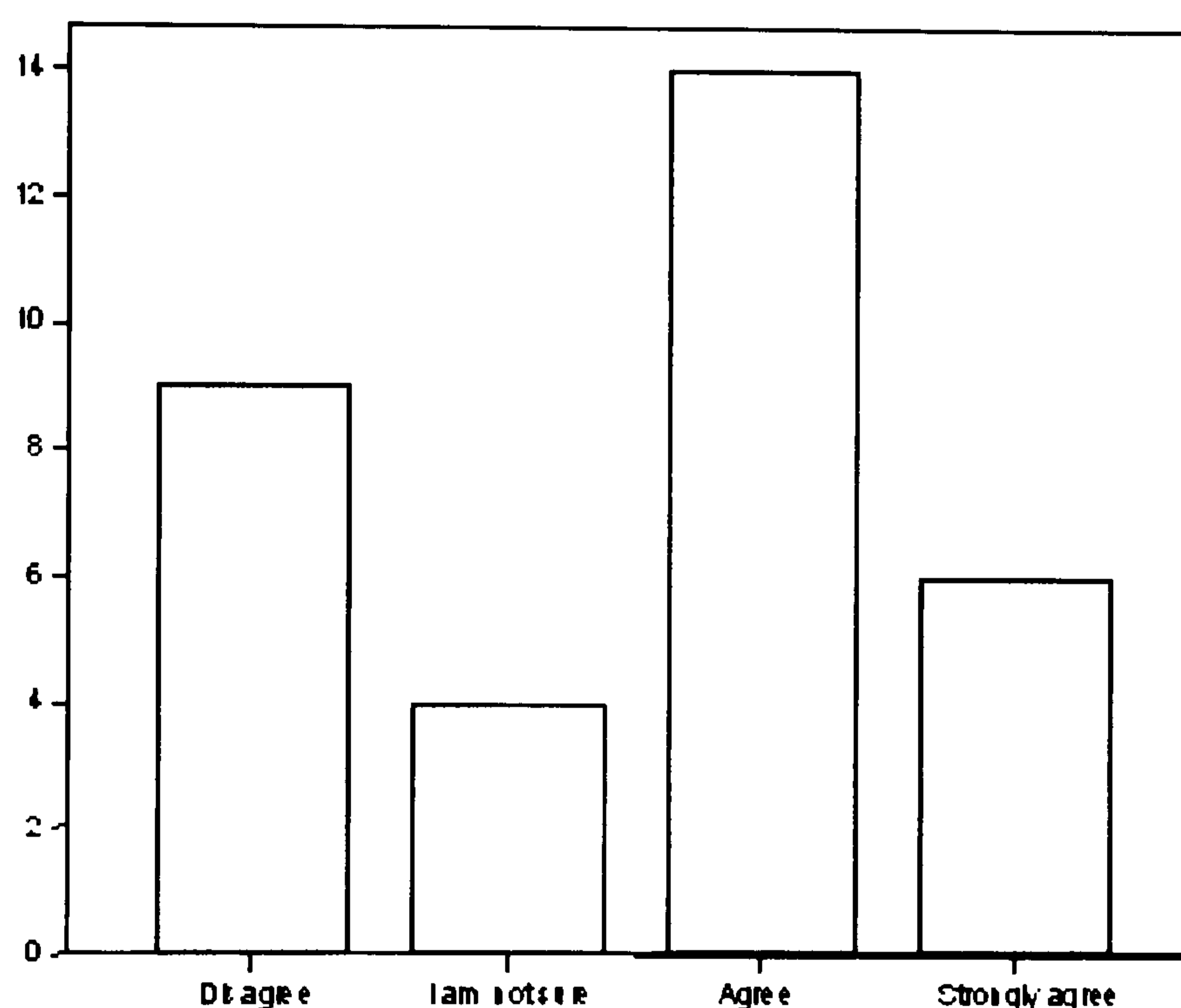


Figure 5.8: The proportion of teachers who thought that there were not many opportunities for using ICT in subject teaching

21 teachers appeared to be convinced that the more they used ICT the more they could achieve good results in classroom, while only two disagreed and ten seemed to be not sure about it. However, even those two teachers who used ICT in teaching the first year after the training did not use it during the second year (see the end of this chapter).

The responses of teachers concerning the content of the training were mixed. 17 teachers thought that the training did not focus on IT skills, there were 12 who disagreed, while

three were not sure. Half of the teachers would have preferred the training to focus more on IT skills, since that was the main reason for which they decided to attend the training.

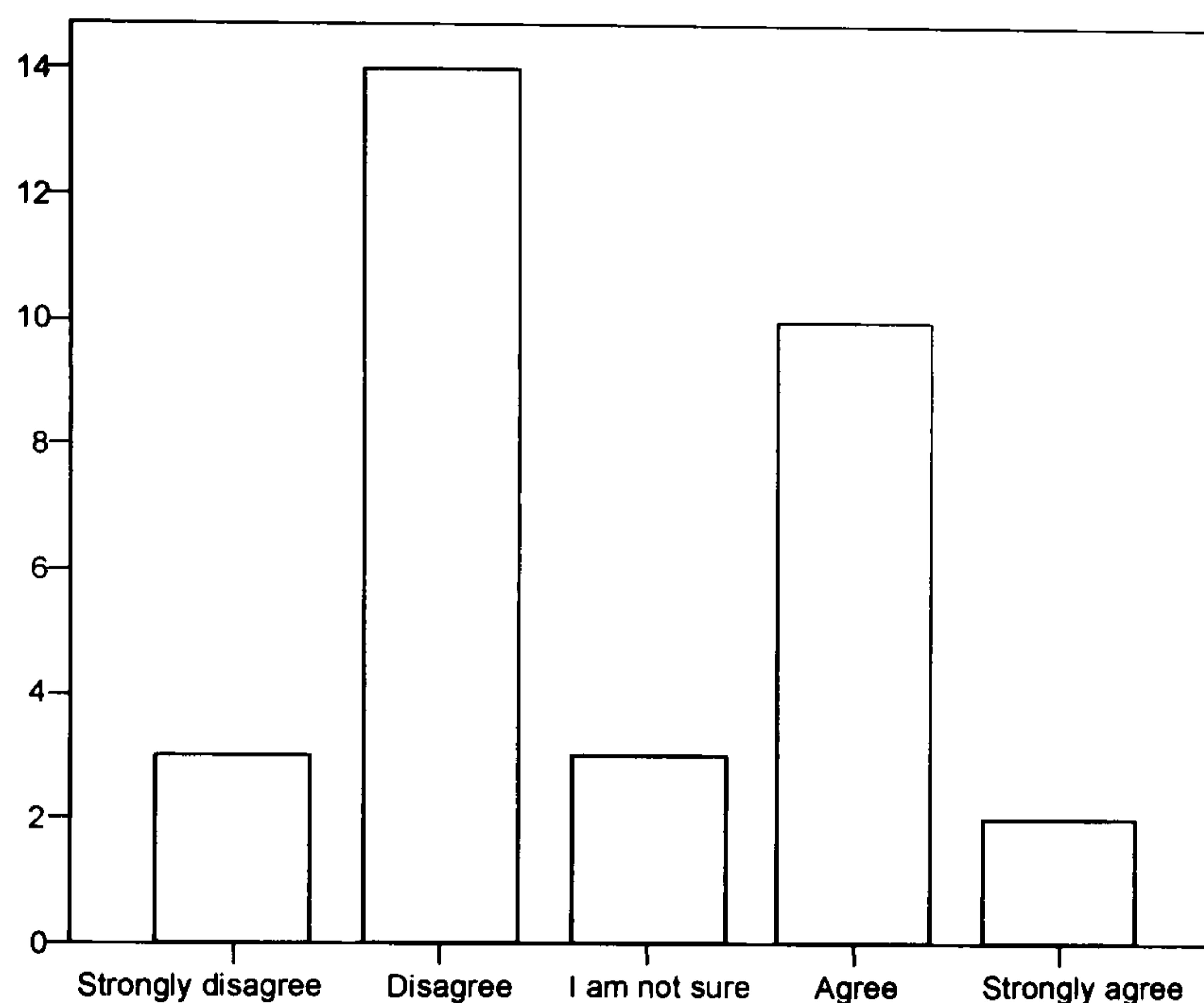


Figure 5.9: The proportion teachers who thought that EE focused on IT skills

5.3.2 Lessons Incorporating ICT

The tasks teachers asked pupils to perform are described in greater detail in Appendix X. One teacher asked pupils to draw a monument, one gave texts downloaded from the Internet but pupils were not given on-line access because they were afraid that the Internet would not work, four asked pupils to conduct a search (newspapers, historical sources) and to fill in a worksheet, three asked them to explore a piece of software, after explaining its use, and filling in worksheets.

Nine teachers were able to carry out one-off lessons with their pupils with the support and physical presence of the teacher-trainer. The rest 25 did not do so. Two of the nine lessons involved some group work and could be said to offer some variation on traditional teaching methods. However, as can be seen in teacher comments, most activities were not seen as very different from traditional ones and as a teacher said 'these tasks that the pupils did on the computer, they usually do them 'by hand' (Teacher 6). Some teachers did not think that the pupils 'learnt things that they didn't know, but they saw another way of dealing with the book material' (Teacher 6). Most of the teachers felt that computers could only help the revision of what they had already taught.

Concerning teaching style, there was only one teacher who saw a difference between traditional teaching and teaching with ICT, declaring her preference for the second, because pupils could get feedback from the machines and they did not need to ask her so many questions (Teacher 17).

Two teachers felt that teaching with ICT did motivate different kinds of pupils, the 'good' ones and those 'who were not interested most of the time found many elements of interest' (Teacher 17).

The teachers who attempted these lessons identified many difficulties in the organisation of classroom and the planning, as they had to transfer the pupils from the classroom to the computer suite. A teacher commented on this point: 'I met some problems in organising not only the teaching, but also the classroom in a new way' (Teacher 8).

The reasons why 25 teachers did not undertake trial lessons were connected to the lack of time arising from work overload, family responsibilities and pressure to keep to the existing curriculum. The teachers had to carry out these lessons at the end of the training, and 'were pressed from family and work, since it was the end of the academic year' and they had to do 'many tests and to finish the curriculum material' (Teacher 10). That meant extra work and stress for the exams as well as absence of many pupils from the classroom in order to study for their approaching exams.

5.3.3 Further Training

Most of the teachers recognised a need for more knowledge about the ways they could best apply ICT to support teaching and learning and to develop their ICT competence. Many teachers appeared willing to attend more training sessions 'but not on theory... more practice' (Teacher 6), because they would have liked to learn more things: 'it's worth using some time, because it will broaden my horizons' (Teacher 2). 25 teachers would like to be informed of progress in educational ICT and only three appeared to disagree and four seemed not sure.

Some teachers regarded the continuation of ICT in-service training of great importance, because, as one noted, 'the relevant machines are changing rapidly and the sites are enriched day after day' (Teacher 12). At the same time others expressed the fear that without any continuation 'everything will be forgotten' (Teacher 20).

Nevertheless, there were a couple of teachers who thought that more extensive training would be useless, because they were not going to use ICT in their classroom anyway and they obviously did not need more knowledge about it. Any further training of the same type would not 'offer anything important' (Teacher 10).

5.4 Teachers' Perceptions of their Teacher-trainer

Most of the teachers thought that their teacher-trainer had sufficient IT and ICT skills, although their subject knowledge was not satisfactory. There were a few teachers who complained about their teacher-trainers' pedagogical abilities as tutors and their administrative methods.

Some felt that the training was 'worth the pain', because their teacher-trainer was the right person as one teacher put it: 'I agree it was worth trying, and as regards our subject our teacher-trainer was the appropriate person for the appropriate position' (Teacher 6).

Most of the teachers said that their teacher-trainer had sufficient subject IT knowledge and showed them the necessary 'tricks' to use ICT effectively and properly in classroom. 26 teachers agreed that their teacher-trainer had good IT skills and only two disagreed and another four teachers were not sure. 27 of the teachers believed that their teacher-trainer had the proper ICT skills, while only two appeared to disagree. Three teachers were not sure. In contrast, 19 respondents noted that their teacher-trainer lacked the necessary knowledge of their particular subject against ten who felt their teacher-trainer possessed the relevant knowledge. Three were not sure.

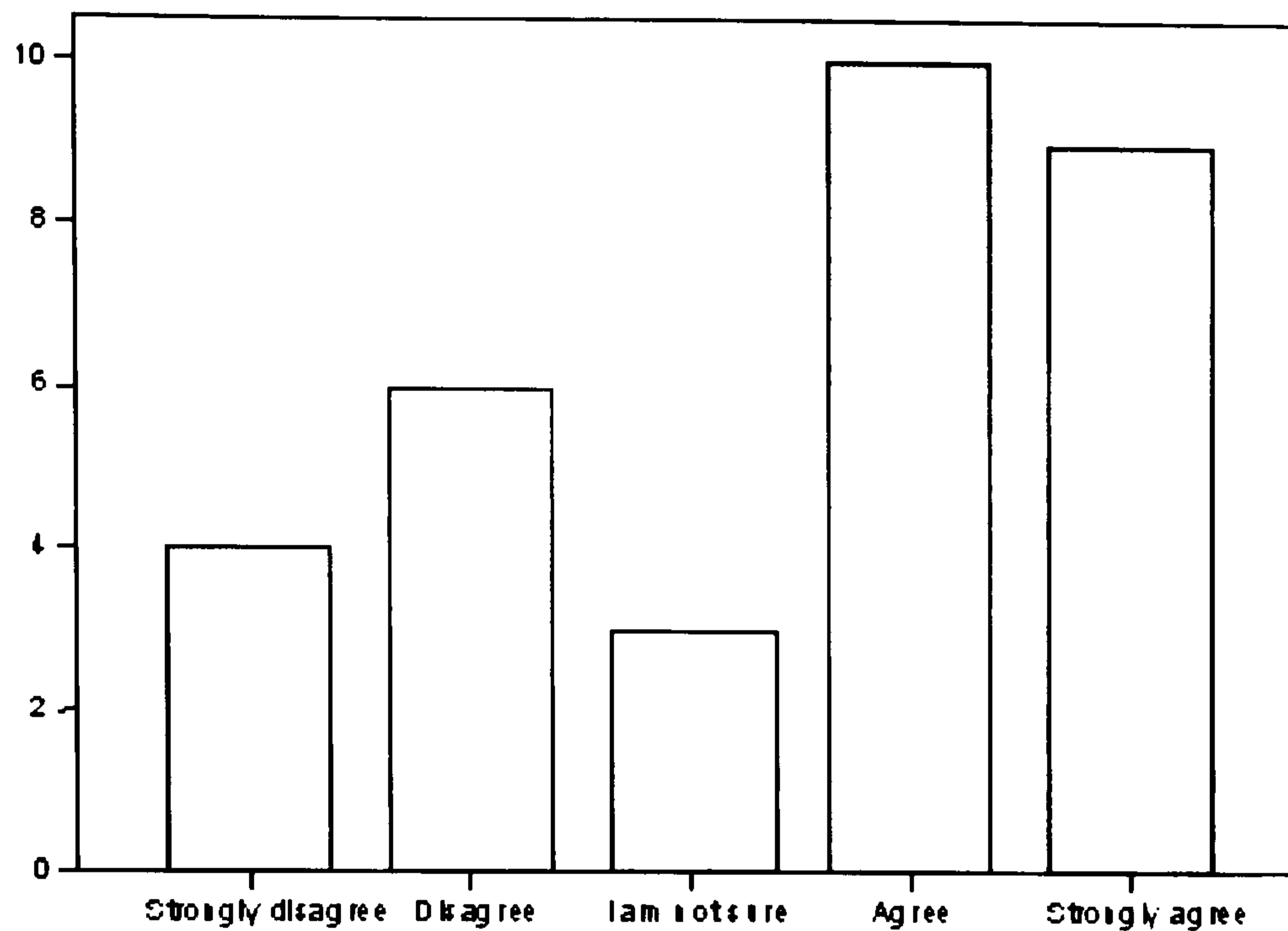


Figure 5.10: The proportion of teachers who thought that the teacher-trainer had insufficient knowledge on their subject

One teacher commented negatively on her own teacher-trainer's pedagogical abilities and ICT skills saying that he 'was not the right person. Maybe it was his way of passing on information. Maybe it was a personality matter... It could be a knowledge issue as well' (Teacher 11).

Another teacher observed that her teacher-trainer limited his teaching to theory and that the training she received had not included enough hands-on practical activities and questioned the quality of the training (Teacher 9).

Two teachers complained about the same teacher-trainer acting unacceptably towards them by not giving them the certificate of attending the training, because they had too many absences. What upset them was that there were others who had missed more sessions, but

as their colleagues were signing them in, and the teacher-trainer did not check the presence of teachers at the sessions in person, they received the certificate of attendance.

5.5 Teachers' Perceptions of their Schools

Even those teachers who believed that the ICT in-service training covered their own needs and improved their ICT skills, and felt confident users of ICT for educational purposes, did not try to integrate computer use within their professional practice. The most serious barriers identified were related to the framework of school as an organisation. Several issues were raised:

5.5.1 Access to ICT Resources

I. Problems relevant to the IT suite use and its implications

Nearly all of the teachers considered the computer suite adequate to their needs but most of them reported several technical problems they faced during the training as well as access problems, since the IT teacher always occupied the suite. Some teachers suggested that, if classrooms had three to four computers, the teaching with ICT would be easier.

28 teachers noted that the computer suite was appropriate to their educational needs, four thought that it was not appropriate and one said that she was not sure. On the other hand, the teachers gave contradictory responses as regards the quality of the provided infrastructure. 15 teachers believed that the infrastructure was not helpful for them to use ICT, while 12 disagreed and 4 were not sure.

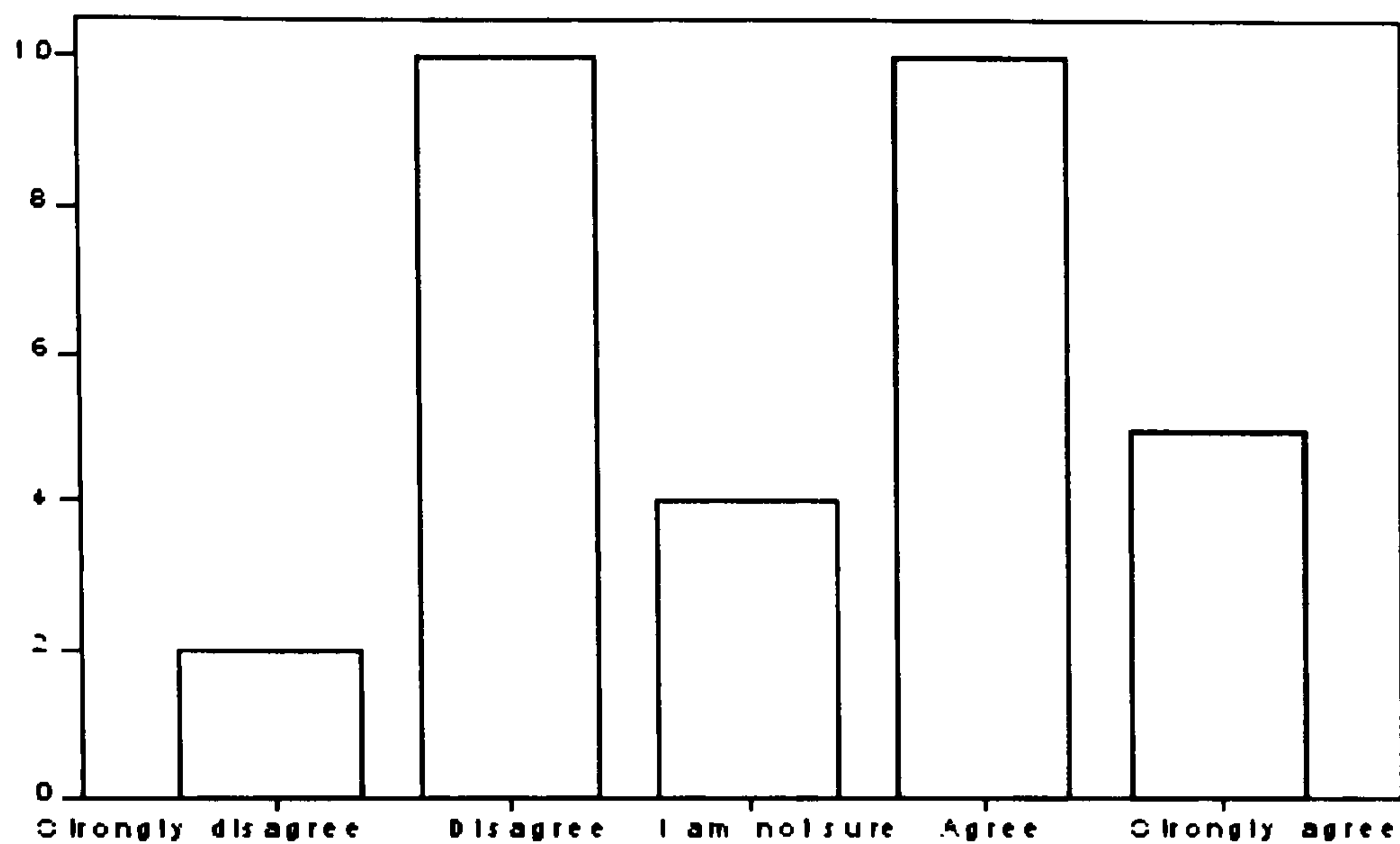


Figure 5.11: The proportion of teachers who thought that the infrastructure was not sufficient to use ICT

26 teachers agreed that they did not often encounter technical problems while working in the IT suites during the training, six disagreed and one was not sure. As regards the use of resources 20 teachers did not have problems getting online, while 11 said that they had some problems and two teachers were not sure.

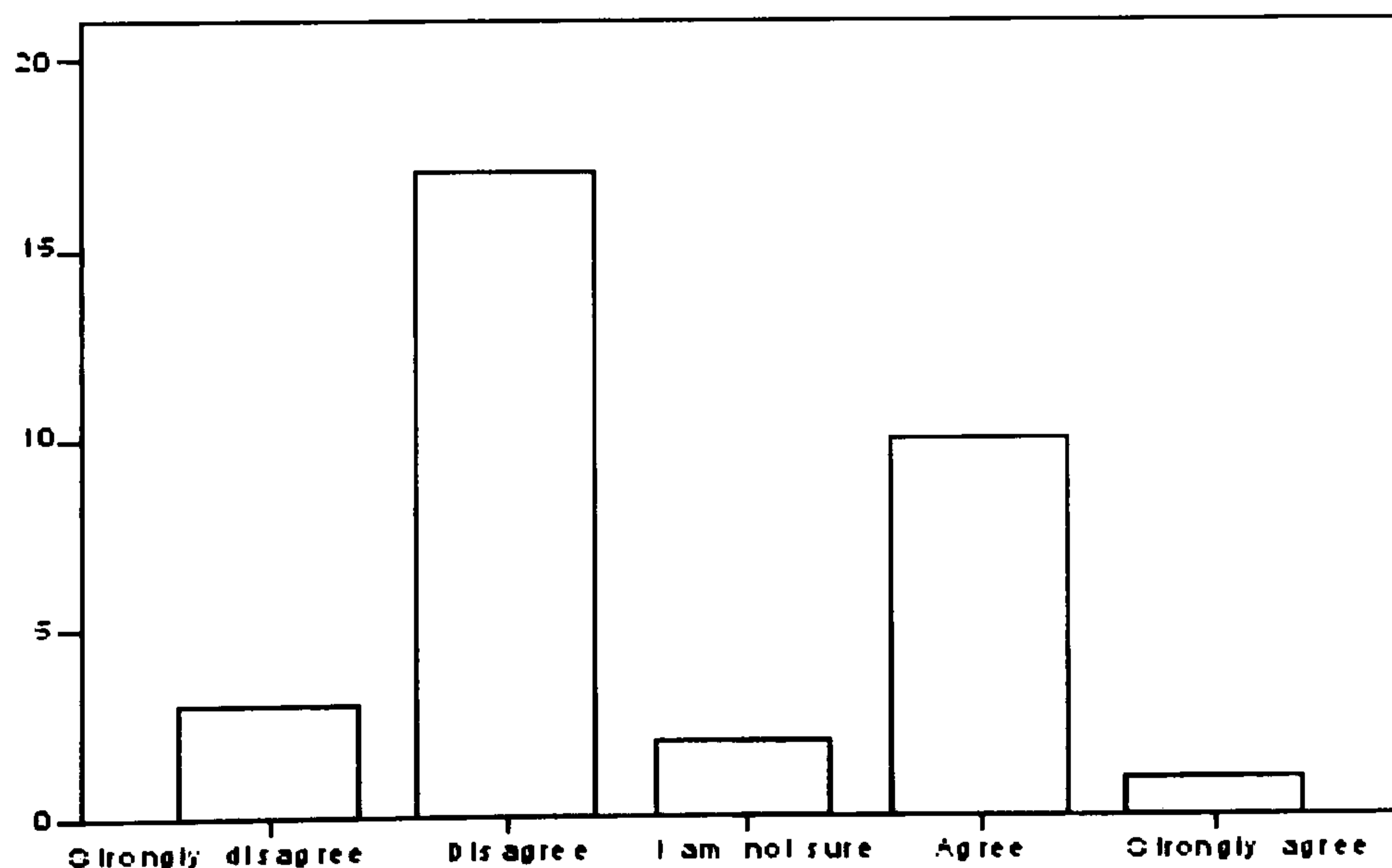


Figure 5.12: The proportion of teachers who had experienced problems with the Internet connection

Some teachers experienced problems with the computers located in their schools' computer suite; some of them were not working or the Internet was down, which discouraged teachers from using it.

Nearly all of the teachers mentioned that the IT teacher tended to occupy the computer suite, so that it was very difficult for them to book it for their lessons. They had to arrange the timetable in cooperation with the IT teacher who 'has to bring the keys, to open the computer suite' (Teacher 4), but this was not a straightforward process, because the demands of the school curriculum gave the IT teacher priority at all times.

At the same time some teachers were ready to make suggestions and propose interventions that could meet these difficulties. A teacher suggested that 'if someone really wants to use it, s/he can overcome these problems. It is a matter of will and good planning' (Teacher 16).

Most of the teachers felt that having to transfer the pupils to the computer suite disrupted the flow of the teaching and said that they would prefer a different structure. A few teachers suggested that the ideal classroom for teaching with ICT would be a classroom equipped with four to five computers, so that pupils would not have to go to the computer suite. However, the majority of the teachers noted that they would prefer a second suite with a 1:2 computer/pupil ratio 'let's say 13 computers for 26 pupils... then it could work better' (Teacher 16). Some teachers thought that 'without a special computer suite for subject teaching the problem cannot be solved' (Teacher 20).

On the other hand, a teacher working in the only school that possessed a second computer suite mentioned that this additional suite was not being used, because it was 'equipped with old computers... They need service'. She appeared to be very uncomfortable in using this suite, because the 'IT teacher worries that someone like her who doesn't know IT will maybe cause troubles' (Teacher 11).

II. Problems related to the lack of appropriate infrastructure

More than half of the teachers pointed out the lack of appropriate software as the major reason for not using ICT in teaching. Some considered the reason for this lack to be financial or simply the indifference of the Ministry to equip the schools with software. A few teachers mentioned their difficulties in installing software, which was aggravated by the lack of technical support. It is worth noting that nearly all of the teachers ignored the existence of the e-yliko website.

Some alluded to the lack of appropriate software: 16 teachers felt that there was a lot of software that they could use, seven noted that they were not satisfied with the quantity of the available software, while nine of them said that they were not sure about it.

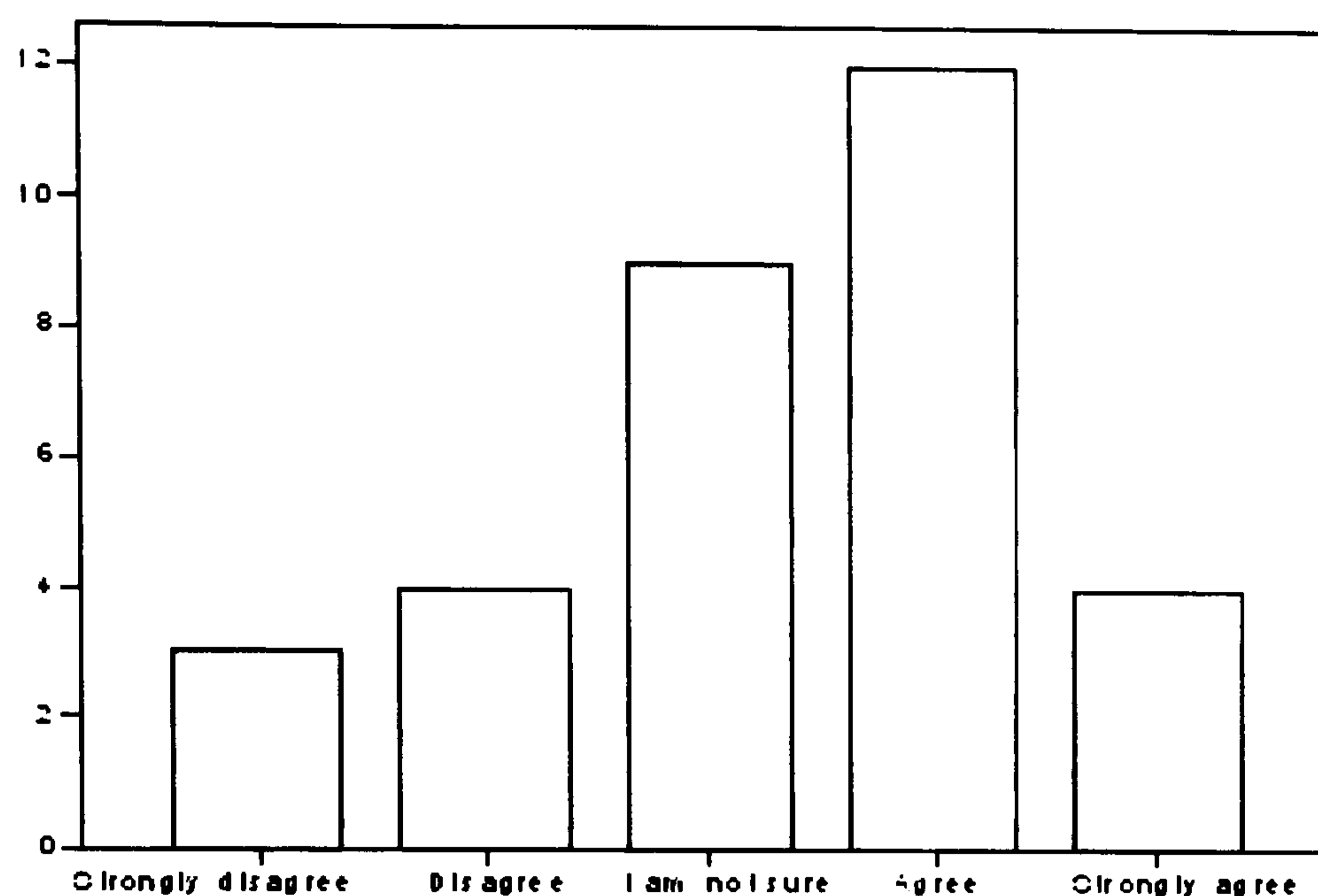


Figure 5.13: The proportion of teachers who thought that there was enough software they could use

Less than half of the teachers referred to the lack of appropriate software. They either did not know any good software to use or the school did not have appropriate CDs or the teacher-trainer did not spend time on showing them. One put it: ‘We receive information from several companies or the Ministry of Education for the available software... what do I care if a CD exists, but I am not able to acquire it in a simple way?’ (Teacher 4).

Some teachers said that they did not have many CD-ROMs and mentioned that the reason was lack of financial resources. The CDs schools did have were left by the teacher-trainers after finishing the training programme. A teacher added that ‘these should be provided by the Ministry in a quite simple way’ (Teacher 8).

For some teachers the problem had to do not so much with the non-availability of resources, but with the lack of access to up-to-date resources, to software that could actually enhance a lesson. More than half of the teachers suggested that the existing

software did not cover their educational needs and it was very simplistic 'because they teach lessons of a theoretical direction that demand a more flexible approach' (Teacher 4).

A few teachers felt that the installation of CDs caused problems for them and they needed to ask for assistance. There was also a teacher who mentioned that one of the reasons for not using computers was the lack of Internet connection at home, since their 'salaries are too low to have a monthly Internet connection' (Teacher 16).

Apart from these from the interviews it became clear that most of the teachers did not really know the way e-yliko website works. Some of them admitted that the teacher-trainer had referred to it, but they had never used it themselves. Only three teachers said that they had used it when working on the preparation of their teachings with ICT with the trainers' assistance.

5.5.2 Lack of Time

More than half of the teachers underlined the lack of time for preparing and teaching with ICT. As some teachers noted, their 'age' demands extra time and effort in order to assimilate what they are being taught and apply it. 22 suggested that teaching with ICT uses up valuable time, seven disagreed and four were not sure.

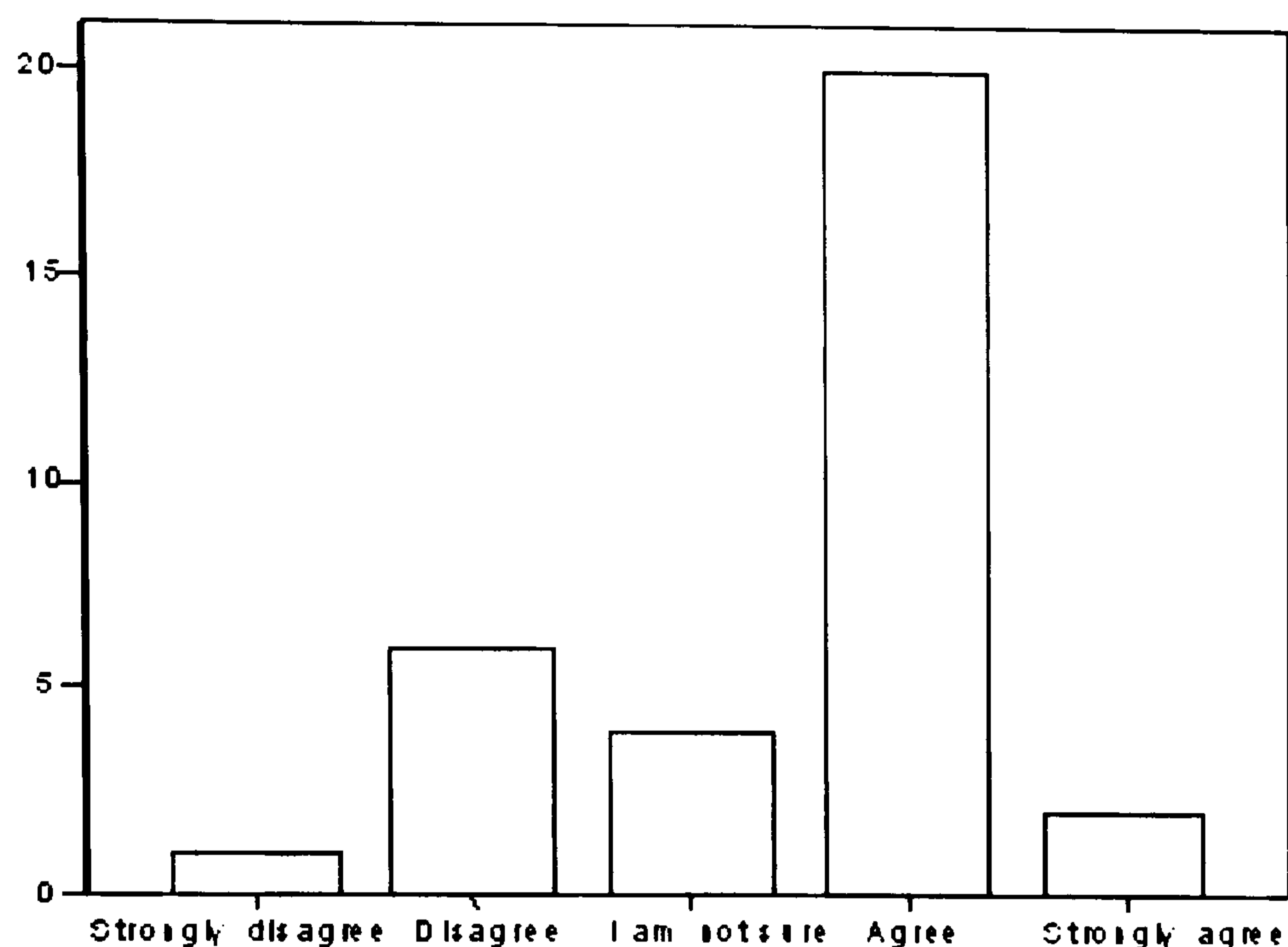


Figure 5.14: The proportion of teachers who thought that there was not enough time to use ICT

Teachers explained that ‘it’s a matter of time and it’s a matter of educational system’; that time is needed for the lesson’s preparation, but also, before that, to ‘sit down and practice what they have learned’. A teacher complained ‘you just can’t give even two hours’ (Teacher 15).

Another teacher added:

If there was an hour in the weekly timetable in which with relaxed pace and outside the curriculum we could see word processing or language exercises on the computer...

(Teacher 13)

Some teachers felt that as they are people of a ‘certain age’, they need more time, in order to assimilate new things, especially when these are related to technology. Some of the teachers were more self-critical saying that they ‘didn’t find time to sit down to apply’ what they learned (Teacher 13).

5.5.3. Lack of Pressure and Support

Some of the teachers considered the support provided by the school management and the Ministry insufficient, since it could not cover even the basic technical problems they were facing. Most of the teachers did not feel comfortable asking the IT teacher for assistance for their lessons and they would have preferred an IT person designated for that post. Some teachers thought that pressure for compulsory ICT use would have positive results although most of them considered that schools and teachers were not ready to take this action.

Most of the teachers suggested that the training could be improved if they were provided with constant and continuous technical and emotional assistance either during preparing their lessons or during their teaching in classroom. A teacher said:

And there should be a person in the computer suite to help us and the children with the technical problems. There should be cooperation between the IT teacher and the literature teachers, in order to build a good schedule, that could work and have good results.

(Teacher 1)

24 teachers worried about technical problems, six said that they did not, while three noted were not sure.

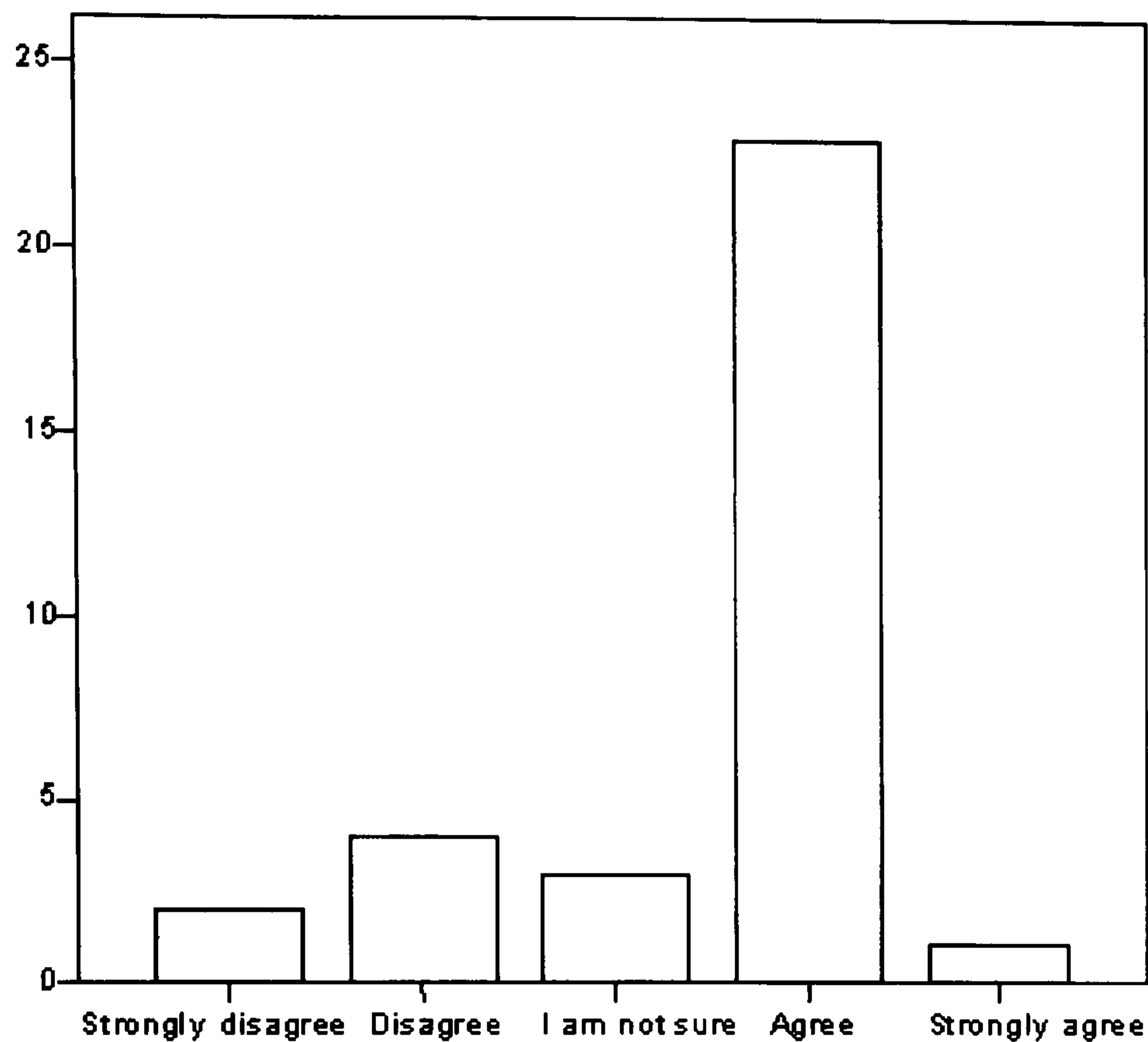


Figure 5.15: The proportion of teachers who thought that concerns over technical problems inhibited their ICT use

Most of the teachers said that they would use the computer suite, if they had technical assistance, so that they would be responsible only for planning and teaching the lesson. Some teachers seemed to be displeased with the fact that they had to be taught technical issues and asserted that they ‘couldn’t get into that logic’ (Teacher 1).

Most of the teachers seemed to be uncomfortable asking the IT teachers to help them, as it was not their role to give technical instructions and assistance to other teachers and would take valuable time from their own subject area. They were aware of the additional burden this could place on their colleagues, and were reluctant to ask help. Furthermore, they did not want ‘to ask the IT teacher a favour and to owe him gratitude for that’ (Teacher 16).

Some teachers felt that there was no support or pressure coming from the school management or other external agents, encouraging or pushing them to exploit what they learned during their training. This is clear from the below dialogue:

-Interviewer: What about the quality of support from the LEA and the school?

-Teacher 6: Yes, of course, if we wanted.

-I.: Has the head-teacher or the inspector ever asked you to use computers?

-T6.: No, but this year they have put a computer here and we can use it whenever we want to do so.

Concerning the attitude head-teachers took towards the teachers who attended the EE ICT in-service training, the teachers never mentioned having a problem with their head-teacher, but it appeared that in almost every case they had not discussed the training with them.

He is from those who seek to implement the use of ICT in her/his school...But he cannot impose its use on his/her school's teachers.

(Teacher 8)

Even in the case of the head-teacher, who had been teacher-trainer for EE himself before, the approach to the training did not seem to be different, although the teachers recognised that, if their head-teacher had not been involved in the training, it would never have happened:

The head-teacher is involved a lot with computers. And the teacher-trainer was acquainted with him. And I guess that this was partly the reason why the teacher-trainer chose his school as centre of the training.

(Teacher 10)

Some teachers wanted further support in using ICT in subject teaching and pointed to the importance of printed material, a companion book or notes of the teacher-trainers' instructions, 'so that you can turn the pages and find whatever you want' (Teacher 1). They felt quite helpless without a reference book to which they could resort, when faced with technical difficulties. The teacher-trainer appeared to give them notes only, if they asked him to do so.

Some of the teachers appeared to believe that support would be positive for using ICT, but not pressure:

I don't really believe you can do that with pressure. You must have good initiative, good information and be persuaded.

(Teacher 15)

On the other hand, there were some teachers who said that there should be a change and that some pressure would be useful:

Because, if you leave it to the freedom of any teacher, maybe you won't achieve anything.

(Teacher 12)

Some teachers agreed with the compulsory use of ICT in teaching and felt that, if ICT use was imposed on them, programme designers would need to make sure that teachers have the necessary training, the necessary technical support, an extra computer suite and the appropriate software. If pushed, they would eventually get used to it and they would have no other option. As one put it:

I would ask for the necessary conditions and it would be positive, I think... If they let me in the present conditions, with the same timetable, with all these subjects and asked me to use computers in my teaching, that would be unacceptable.

(Teacher 11)

5.5.4 The Demands of the Curriculum

Most of the teachers seemed to agree that they could not use ICT in their lessons and at the same time to keep up with the demands of the curriculum. The material teachers had to cover was huge and the use of ICT could be employed only for revision of the material taught or for breaking the routine and variety, but that would take up lots of their valuable time.

A teacher felt that during the training she found out that ICT could not keep up with the curriculum:

Whenever there was a chapter for which someone had done trial lesson, a chapter that we should teach in 45 min time, they (i.e. the teacher-trainers) presented it using 3-4 hours.

(Teacher 11)

One teacher underlined the problem of having too many subjects to teach, which made it very difficult for them to find time to plan for change. She said that 'It's impossible to do this (i.e. to use ICT) with all these subjects I have' (Teacher 6).

5.6 Perceptions of EE Programme Impact

Teachers were asked to comment on the impact the EE ICT training programme had and the changes it caused on a personal and school level:

5.6.1 At a Personal Level

The training seemed to have little impact on teachers' practice. Only two teachers did try to use ICT by themselves the year following the training (see below). Ten teachers thought that the training was sufficient to enable them use ICT in teaching, another ten were not sure and 11 disagreed. Although most of the teachers admitted that they had progressed in ICT during the training, less than half said that they did not learn a lot and an equal number of teachers were unsure about it. Finally, 12 teachers said that they would try to use ICT in subject teaching in the future, 16 teachers were not sure and only five stated that they would not use ICT at all. Some of the teachers were still doubting of the usefulness of ICT use in teaching after the training, and although they could theoretically point out some advantages of ICT, such as the collaboration of pupils, they were sceptical towards its use.

Some teachers seemed to believe that they had made 'considerable progress' in using ICT, since they 'started from knowing nothing' and now they possess 'a lot of ICT knowledge and skills' (Teacher 17). However they declared that they had decided not to use computers in their work except for typing in texts and finding information. But the majority felt the training did not fundamentally add to their existing skills. A teacher commented:

I knew word processing. That's what I mostly needed and I had to ensure that I knew it.

(Teacher 4)

As it concerns pedagogical implications, many teachers did not appear to have altered their attitude and stance:

My work hasn't changed, but in finding information you have many options... The pedagogical view hasn't changed.

(Teacher 1)

23 teachers agreed that the training improved their IT skills, five did not see any improvement and four were not sure. Similarly, less than half of the teachers, more specifically 16, suggested that they did not learn a lot during their ICT training session, while almost an equal number, 11, were not sure about that and only four teachers felt that they learned a lot.

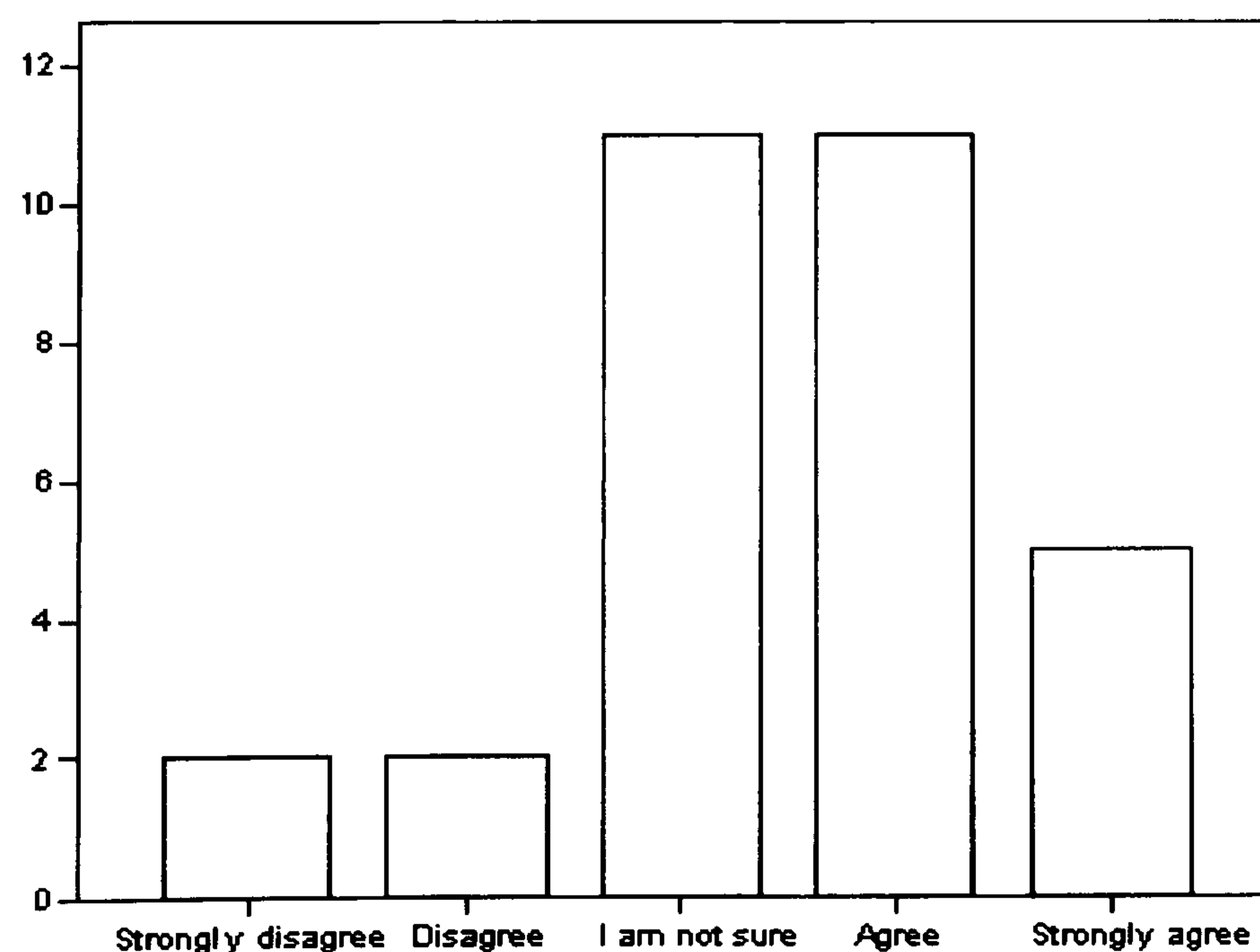


Figure 5.16: The proportion of teachers who thought that they did not learn a lot

In a similar question referring to time spent on learning what the teachers already knew, nearly all of respondents, 28, felt that they did not spend much time on learning what was known and only one teacher disagreed.

21 of the teachers felt the programme was effective in teaching ways of enhancing learning and teaching, six teachers disagreed and four were not sure about it. Beyond this most of the teachers, 25, felt that the teacher-trainers tried to cover all the material, but they did not offer them examples related to their subjects, while a small minority, four, disagreed and two of them were not sure. The teachers found the teacher-trainers' attitude and approach understandable, because the material that had to be covered by them was too vast: 'He tried to cover all subjects that are taught in the two levels of secondary education' (Teacher 1).

The Gymnasium teachers found the content of the training more transferable and suitable to their classes, while the teachers serving in Lyceums found the applications irrelevant to their needs, with the result some of them to drop out or see no practical usefulness in the training.

The teachers were asked about the impact EE ICT training had on their pedagogy. 18 teachers felt that the training enhanced their pedagogy on ICT, while 11 adopted an opposite view and four appeared not sure on this point.

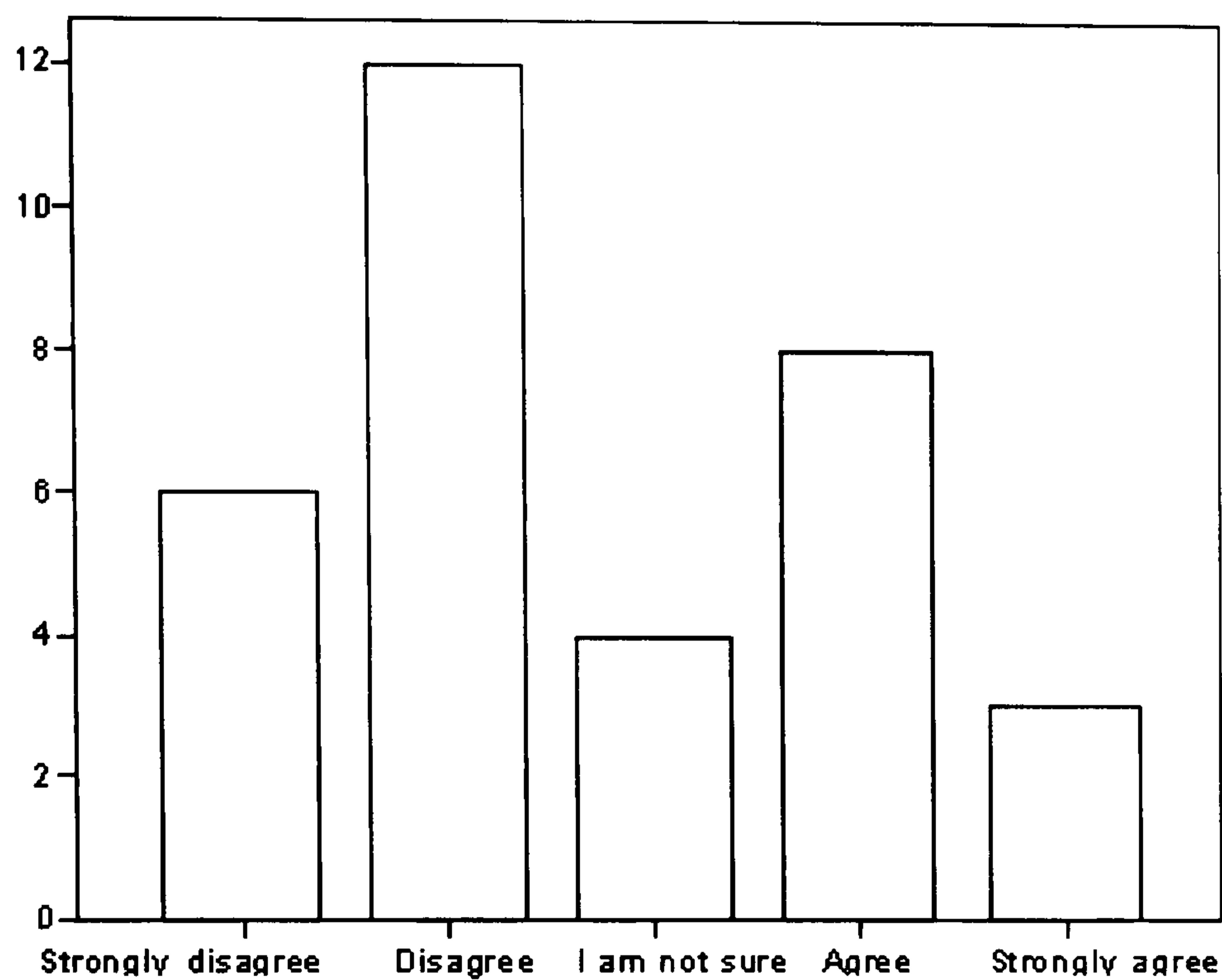


Figure 5.17: The proportion of teachers who thought that EE did not enhance their pedagogy on ICT

Accordingly, ten teachers thought that the training was sufficient to enable them use ICT in teaching, another ten were not sure and 11 disagreed.

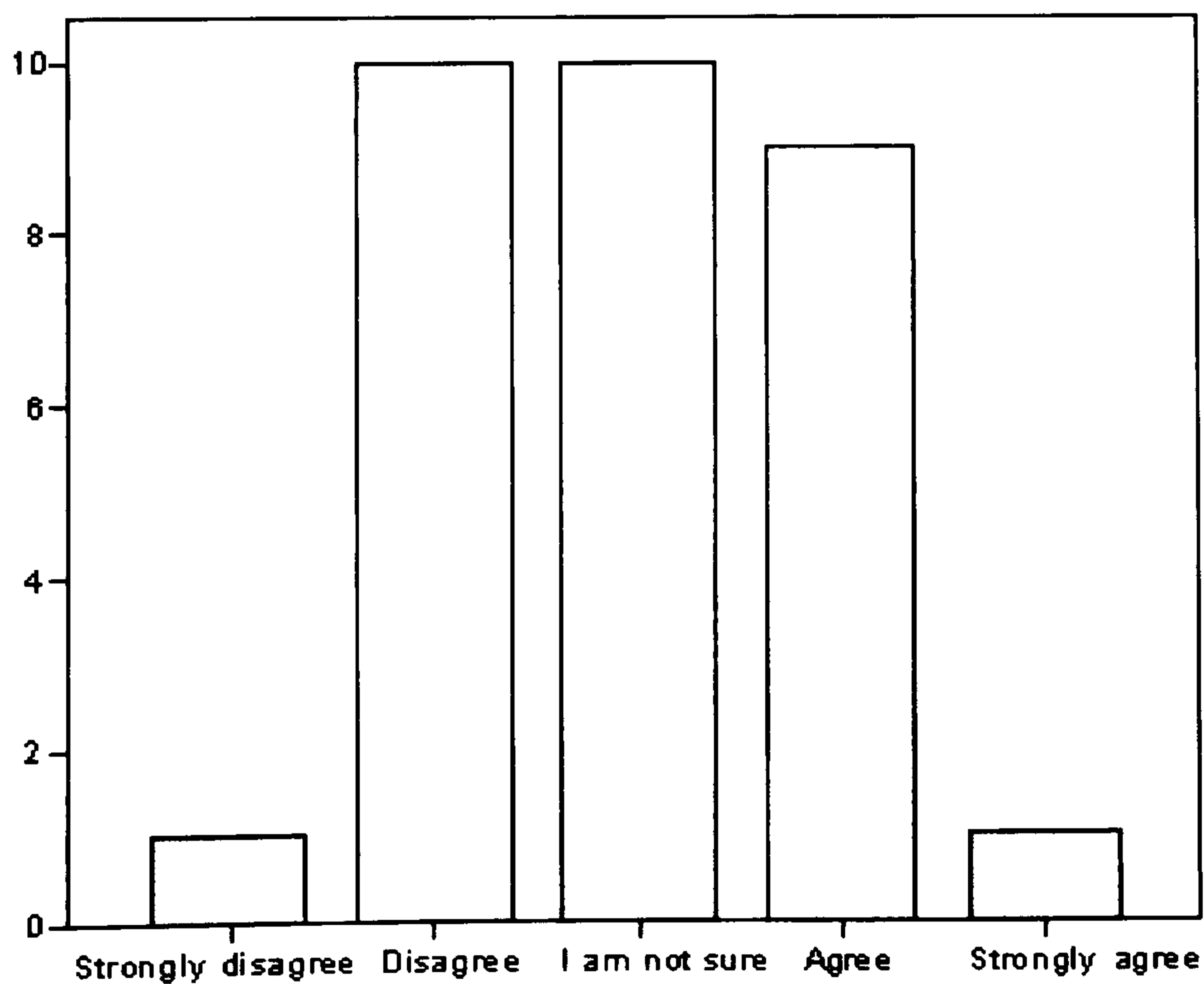


Figure 5.18: The proportion of teachers who thought that EE was sufficient to enable them use ICT in teaching

In addition, 12 teachers said that they would try to use ICT in subject teaching in the future, 16 teachers were not sure and only five stated that they would not use ICT at all. Most of the teachers said they would like to use ICT in their subject teaching, but in areas not connected to the examinations that lead to universities. The curriculum demands put some restrictions on teachers, especially those working in the Lyceums, since the pupils are 'interested only in issues that are related to the process of admission to the University' and they are 'preparing the pupils just for this purpose' (Teacher 12), and makes them not want to use ICT in their classroom.

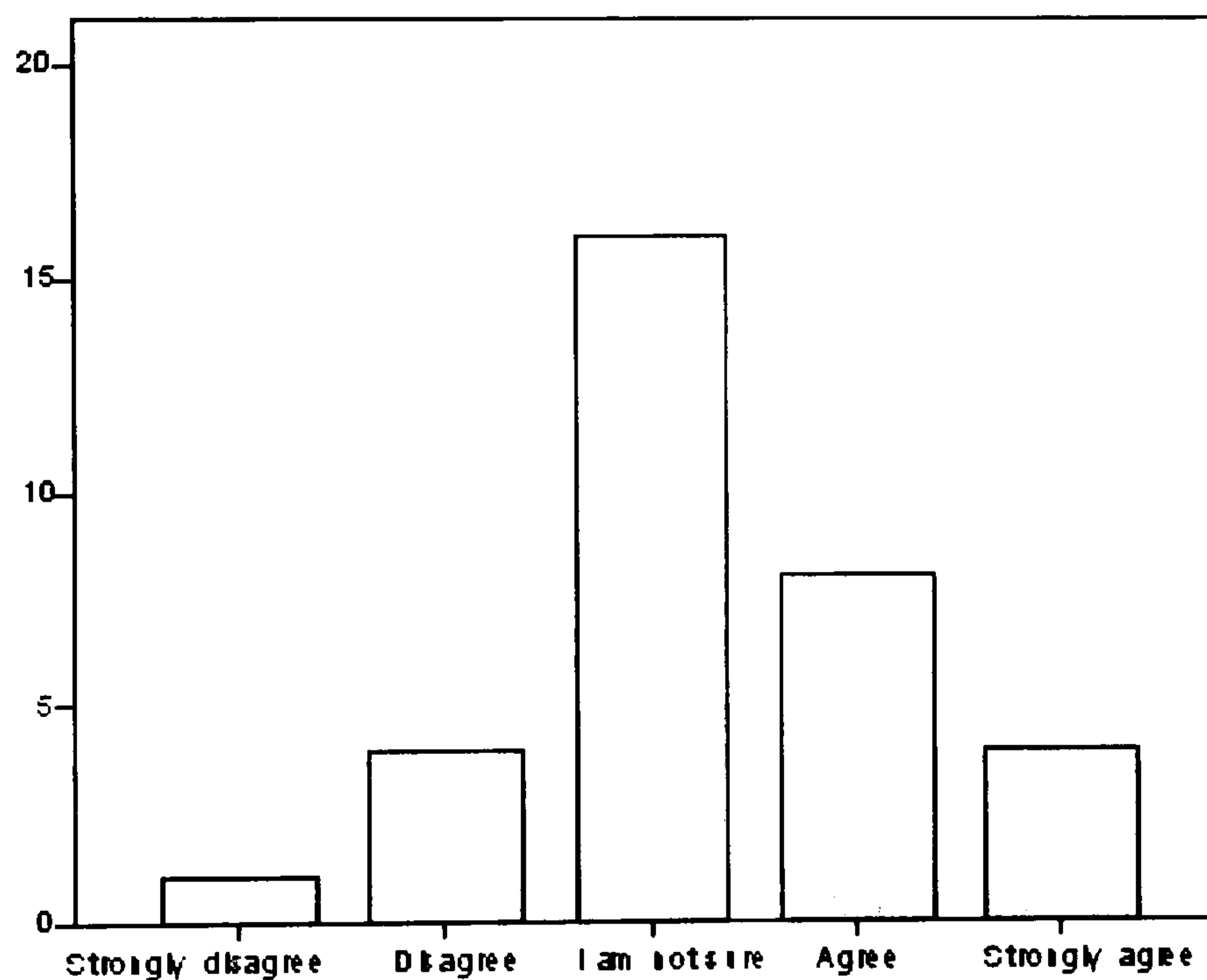


Figure 5.19: The proportion of teachers who thought that they would be using ICT

Regarding teachers' perceptions of the importance of ICT, more than half of them accepted that ICT could present some aspects of a subject in a better way in comparison with the traditional methods, but some still doubted about the advisability and usefulness of ICT use in teaching and learning. One felt that she 'can't accept right now that computer is as

important as a book' (Teacher 12). Some of the teachers seemed to believe that they 'have to be persuaded first, and of course to have received training' (Teacher 15) before starting to use it, because in that way they would see the significance of what they were to do.

One of the teachers who questioned the educational potential of ICT use in classroom felt that 'A teacher that has been doing the same things for so many years... can do her/his lessons in an effective way without using computers' but through 'traditional techniques' (Teacher 10) as they did in the past. 26 teachers felt that they could be good teachers without the help of ICT, only two disagreed and five were not sure. Most of the teachers made clear that in their judgment 'good' and 'effective' teacher is one who 'will come to school, will do her/his lesson, will put exercises and will correct them' (Teacher 6).

Nearly all the teachers agreed that computers cannot take the place of the teacher in classroom, a view supported by 32 teachers, while only one noted not feeling sure.

Some teachers asserted that Greek schools have too many other more serious and more urgent needs than computers such as, for example, providing playgrounds and establishing libraries. One of them insisted that libraries are more important than computers, because they open the pupils' mental horizons, and, when he was asked whether computers could have the same result, he responded that 'libraries are forever, while educational technology is just a trend, which will disappear quickly, as educational television did, because it does not fit the reality' (Teacher 9).

Many teachers were unable to point out some specific advantages or disadvantages of ICT use in teaching and learning. One of them confessed that 'except for the fast finding of information and the filling in tables, I can't find any advantage' (Teacher 5).

Some teachers did admit that ICT properly used could contribute to effective teaching since 'some subjects... can be done better with the use of computers' (Teacher 2).

Another teacher underlined the utility of ICT in assessing pupils' progress, as it can be done 'with a set of questions of an objective form'. According to her this activity is 'a pleasant, fast and in most cases objective form of examination' (Teacher 2).

But, in spite of the fact that many teachers felt that ICT use can help the collaboration between pupils, which was positive since 'each pupil could contribute according to her/his ability for the common aim to be achieved' (Teacher 6), most of them seemed to avoid employing group-work techniques in their classrooms either because 'some lessons are indeed better to be conducted in the traditional way' or because it causes waste of time or simply because the teachers 'don't believe in it' (Teacher 2).

Some other teachers mentioned that ICT properly used enables pupils to learn by themselves, to explore and research, and, the most important of all, motivates them. Two teachers expressed this saying:

I think that the pupils, while searching for several things by themselves, get into the process of learning. I consider it very positive. In addition, what you have given them already, the knowledge they acquire when searching is quite important.

(Teacher 8)

Computers activate even pupils who in a normal classroom are passive and are simply waiting to get everything ready either from teacher or from their classmates.

(Teacher 7)

27 out of 34 teachers believed that ICT could motivate pupils, five appeared not sure, while only one disagreed.

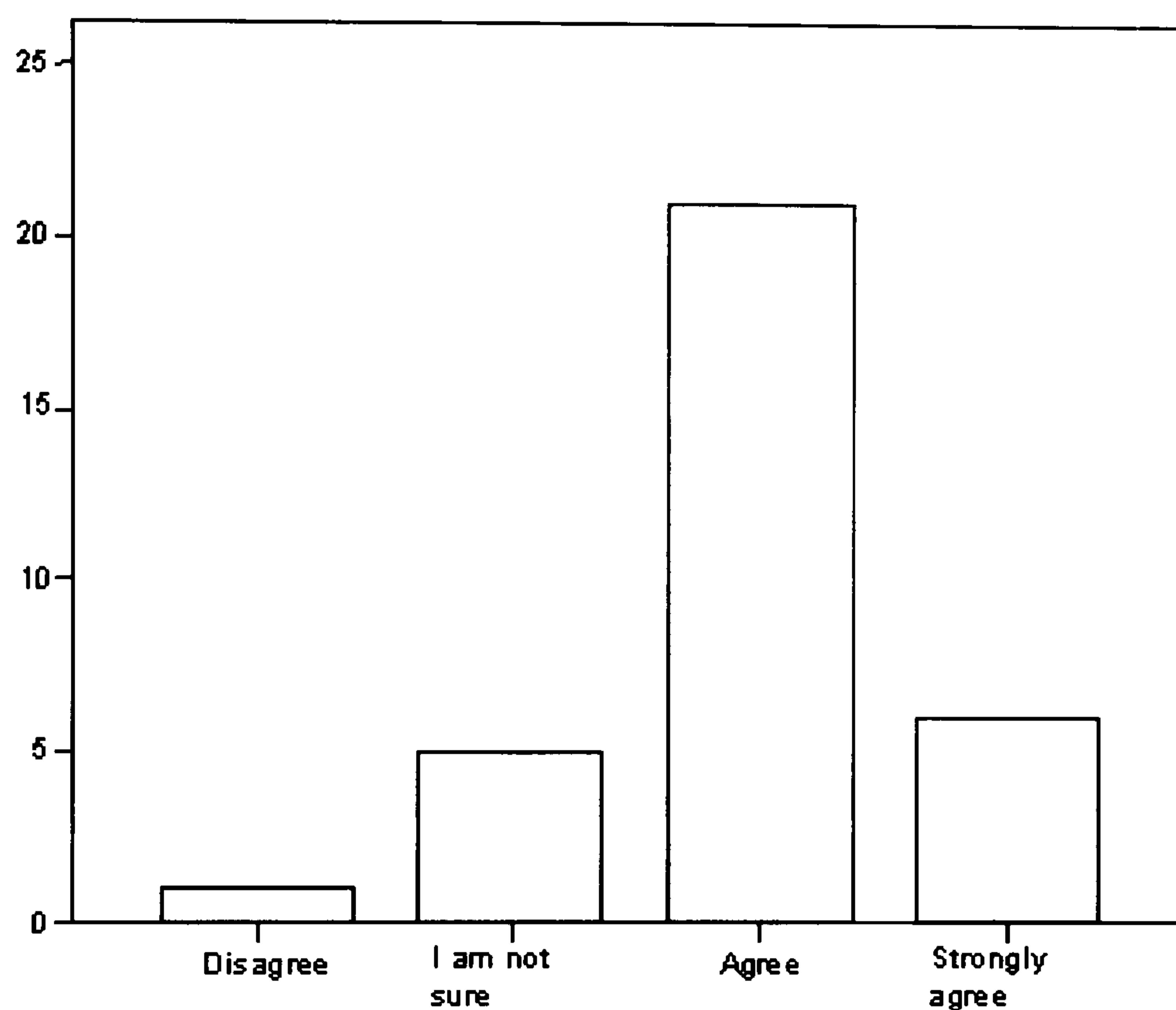


Figure 5.20: The proportion of teachers who thought that ICT could motivate pupils

Another advantage of ICT use in classroom referred by most of the teachers was that pupils might have more computer skills than their teachers and could teach their teachers. As some said, 'it makes them (i.e. the pupils) happy to teach their teacher something. The climate is changing. And they are happy, when we express the will to learn something from them' (Teacher 11). But there were six teachers who were not sure whether ICT subject teaching makes lessons more enjoyable and one disagreed.

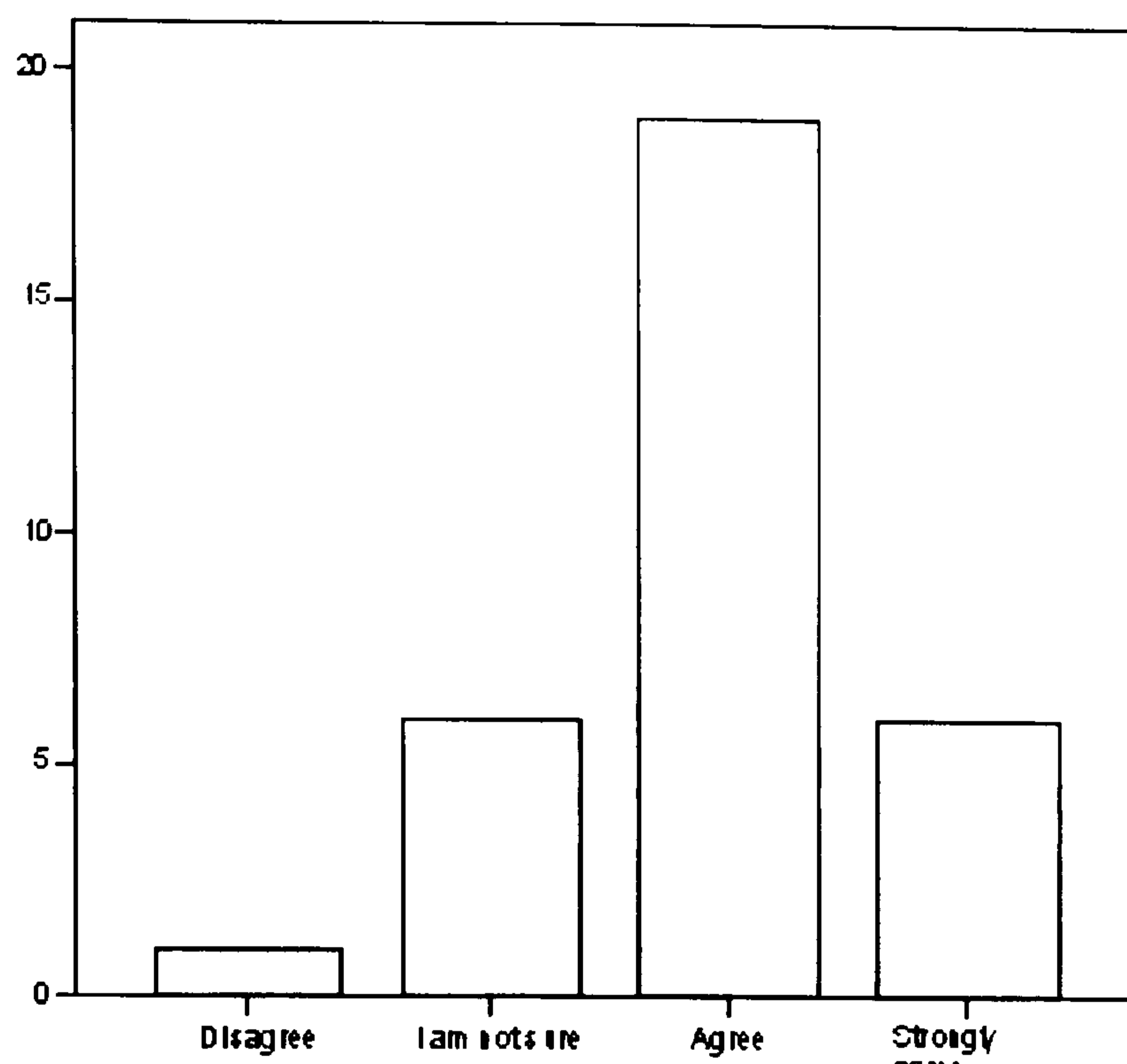


Figure 5.21: The proportion of teachers that thought ICT could make the lesson more enjoyable

Likewise, teachers gave several and sometimes opposing responses to the questions about the eventual negative results of ICT use. Many teachers referred to the large number of pupils in a classroom, around 25, which usually made it quite difficult to take all the class in the computer suite and caused loss of valuable teaching time. They expressed fears that pupils could be playing games during subject teaching and they themselves could lose control over their pupils. Most appeared to lack confidence in front of pupils, who were of different ICT and subject knowledge background.

In addition, the majority of teachers maintained that the lack of Greek websites, as well as the slow download speeds reduced considerably the value of using ICT in subject teaching. 22 teachers thought that ICT was not an obstacle in the organisation and function of the

classroom, eight appeared not to be sure and three other teachers considered it to be an obstacle.

5.6.2 At School Level

At school level some teachers noted that after the training 'nothing changed in the function of the school' (Teacher 1) that could help them to put into practice what they had learnt.

More than half of the teachers, 17 in total, agreed that they had few opportunities for cooperating with their colleagues, but eight suggested that they had some and seven were not sure.

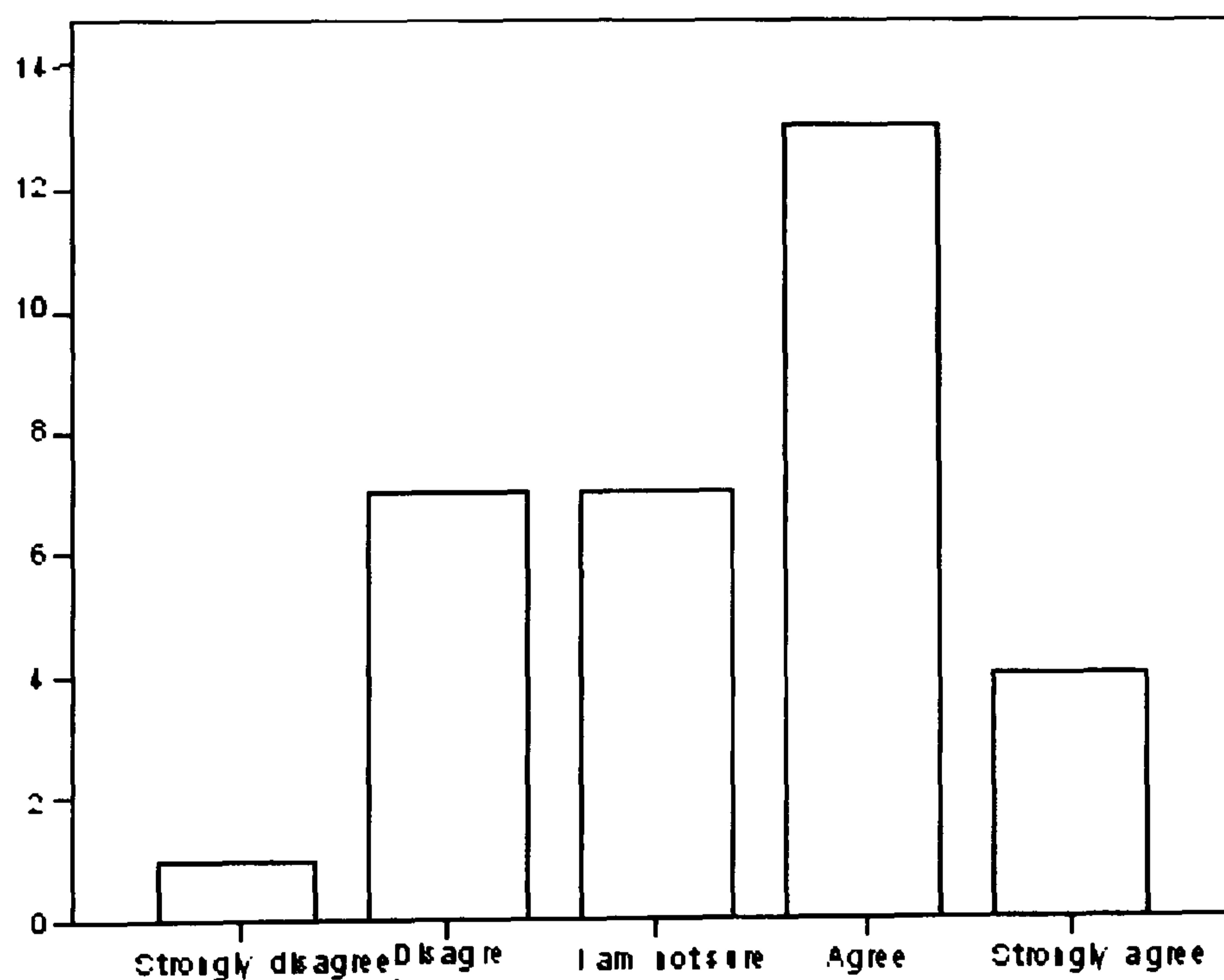


Figure 5.22: The proportion of teachers who thought that there were no opportunities for cooperation

Some the teachers felt that, although they had opportunities for cooperation during training sessions, there were few outside the training, since they focused on finishing the curriculum and this made their 'relationship more competitive' and stressed them (Teacher 4).

Even in schools where three or more teachers attended the ICT training it seemed that no cooperation existed after the training:

-I: There were another 2-3 teachers from your school attending the training... was there any cooperation between you?

-T5.: No.

Some teachers accepted that they did not know the level of their pupils' IT knowledge and that was very discouraging and made their work more difficult. According to them this is one important factor, which demanded teachers' cooperation. One teacher suggested that the difficulty of having pupils with various IT backgrounds could be met if the IT teacher was ready to cooperate with the subject teachers and to give them information about pupils' knowledge.

5.7 Teachers Who Use Computers

Although nine teachers used ICT with the teacher-trainer's support during the training, there were only two teachers who tried to use the computer suite after their training. Both of them were female from 40-49 years old with 21-25 years teaching experience. One of them had a computer at home for more than four years and the other for more than eight

years. They both had an Internet connection at home and they used it for activities not connected with school issues or their teaching preparation. The applications they used for teaching were Word, Internet and one of them used Power point as well. They had similar teaching experiences to the majority of the teachers involved in the research and they said that they acquired their ICT knowledge in the training.

The first teacher declared that she used the computer suite once a month with different class and that she prepared her lessons using www.e-yliko.gr and www.comvos.gr. She also noted that she used to download exercises, but she changed them before giving them to her pupils. He asserted that the TSC training did not offer anything to her; that it was too much for the beginners. She asserted that, since there were no exams for the certificate at the end, everything would soon get forgotten. According to her declaration she had no previous experience, but she learned everything during the EE ICT training programme. She found it very exciting to work using computers, and that is the reason why she did it. In addition, she seemed to think that teaching in a traditional way had become a routine and there must be something new; that there were problems but they did not put her down. According to her the trained teachers do not implement ICT in their teaching because of technical reasons. She said that other teachers did want to use them, but they are deterred by the supposed technical problems and the insecurity they felt. She also appeared to believe that it would be better and it would encourage the teachers to use computers if they were located in their classrooms.

The second teacher asserted that she used to take groups of pupils in the IT school suite and to repeat the lessons she had done with the teacher-trainer's assistance. She had never used e-yliko for preparing her teaching and she was not sure she knew anything about it. She considered very important for children to escape from their everyday routine and seemed to believe that computers could help stimulate them to try to find necessary information by themselves. She added that the use of ICT could motivate the pupils to enter new 'roads', different from those suggested by the school textbooks. She learned everything she knew from TSC and EE training programmes which she thought quite positive, but added that she kept practising at home as well. She considered that the teacher-trainer had guided the trainees correctly and were able to solve any problem they faced, but she found that a bigger school computer suite with a different arrangement of computers in it would be more helpful and that a change in the school's structure, in the curriculum and the examination process could encourage teachers to use ICT in their teaching and not consider it a waste of time. She thought that it is impossible for teachers to use the available software, because it did not correspond to curriculum demands and that the Ministry of Education should equip schools with updated CDs, which exist in the market.

The key factor that differentiated these teachers from the rest was their willingness to experiment and present something different to their pupils, something to attract their attention and help them learn. One of the teachers prepared lessons while making use of the electronic resources available. The other teacher used the lesson she had practised

during the training. This means that she was using ICT, but not becoming an independent developer of ICT, because, as she said, due to lack of enough time for preparation. Although these two teachers were not put off by difficulties of access or technical problems, they felt that lack of time was a serious factor that deterred teachers from ICT use. The fact that all teachers faced the same difficulties, but still there were teachers who got over them means that these difficulties maybe shaped, but did not determine their stance towards ICT and its use in classroom. It is worth mentioning that their head-teachers were from those who were very supportive of ICT themselves. One of them was ex-teacher-trainer on ICT in subject teaching and the other one had an MA in educational technology and used ICT in his teaching.

It is worth noting that in two follow up interviews, which took place one and a half years after the training and one year after the first interview, these two teachers did not use the school IT suite anymore. One of them had been placed in a position with increased administrative responsibilities, while the other had health problems, which kept her away from her teaching duties for some period of time.

5.8 Chapter Summary

In this chapter, teachers' perceptions of the EE training and their opinions about good practice and effective ICT training were presented. The impact of the EE in their everyday practice appeared to be minimum or non-existent and they gave the reasons for that. Those who were affected by the training tried to give their explanations as well. In the next

chapter, the views of the head-teachers of the schools which were implicated in the training process are explored.

CHAPTER 6: DATA FROM HEAD-TEACHERS' POINT OF VIEW

6.1 Introduction

In this chapter, data collected through interviews with the principals of the schools of which teachers had taken part in the EE ICT in-service training programme is presented. The head-teachers were asked to express their opinion about the educational potential of ICT in general, the reasons that make teachers use or avoid ICT use, the impact of EE, and their suggestions for better practice in ICT training.

6.2 Information about the Traits of the Head-teachers

Nine out of 15 head-teachers, whose schools were involved in the EE training process, were ready to participate in the research and were willing to talk with the researcher. The rest, six, of the head-teachers, who were approached, refused to participate because, as they said, they did not have enough time. In general, they were not negative towards the research, but they were unwilling to participate. Nearly all of them had many years of teaching experience and/or were experienced head-teachers as well and most of them were positive towards the introduction of ICT in schools.

Seven head-teachers had basic IT knowledge and skills and 4 had attended training sessions, either in private and/or in the TSC and the EE training programme (1, 4, 6, 9).

Three of them had a Master Degree in technology in education (3, 7, 8) and two had been teacher-trainers in the EE training programme (7, 8). One head-teacher, 5, had no experience of computers and ICT at all and another one, 3, did not offer any information about his relevant knowledge.

More than half of the head-teachers were trying to integrate ICT in their schools, while one of them, 3, was actually teaching with ICT. Head-teacher 4 was a very innovative head-teacher and willing to promote changes and reforms in his school. He was a very experienced computer user as well and used databases for the school information at home because, as he said, 'the school had not such facilities in the past...'. He asserted that he never wrote anything by hand. Head-teacher 7 was an ex-teacher-trainer and very ICT literate and was very concerned about equipping his school with computers by asking for them from banks, which had finished with them, and putting them in the teachers' office. He justified it saying that 'Exactly for giving them the opportunity not to forget what they have learnt...'

Interesting was the case of head-teacher 4 who, although he was very keen about the use of ICT, did not know that some of his school's teachers had attended the specific EE training course.

6.3 The Head-teachers' Perceptions about the Educational Potential of ICT

The interviewed head-teachers expressed different opinions about the educational importance of ICT. Most of them agreed that ICT would be beneficial under certain conditions such as the reform of the curriculum. There were though some head-teachers who were in doubt about the potential of ICT, if not against its introduction.

Some head-teachers were not sure about the beneficial contribution of ICT use in subject teaching and said that they wished to see ICT working in the classroom in order to be persuaded of its positive results: 'It hasn't been used in my school, so I can not judge' (Head-teacher 6).

Some head-teachers recognised that the introduction of ICT in schools might enhance the teaching and learning process and contribute to its improvement, but they appeared somewhat suspicious about the real intentions and motives of the establishment of the ICT training programme. As one of them reported:

I think that they (i.e. the government and the companies) just want computers to be sold and everything is working for companies' good.

(Head-teacher 2)

Nevertheless, there were more than half of the head-teachers who genuinely thought that ICT use in teaching and learning could offer new possibilities in the educational field. A head-teacher expressed this saying:

I do things that I couldn't do with chalk. Because until now ICT was in your blood, while now it is a need.

(Head-teacher 3)

But other head-teachers, while recognising ICT capability to change schools for better, took a middle position and stressed that ICT use and the novelties it brings in education could have a positive impact under some specific pre-conditions such as the reform of the curriculum and of the current examination process. A head-teacher explained this point:

If I have a certain curriculum and the parents and the pupils want to succeed at university, they won't listen to me, saying that I am doing a long-term work... we need more time and a different way of exams. And a different kind of curriculum.

(Head-teacher 8)

Some head-teachers referred to specific advantages and disadvantages of the ICT use in classroom. They agreed that ICT properly used could immediately help pupils to acquire the necessary knowledge and mentioned the 'large quantity of information' that can be found on the Internet (Head-teacher 5).

A head-teacher focused on the power of visual effects that ICT could provide saying 'the impression of the image for the pupils is very important' (Head-teacher 6), while another underlined the capability of ICT to introduce pupils to 'the culture of their Age' and to prepare them for their future life in the information society (Head-teacher 8).

A few head-teachers focused more on the effect ICT use in teaching and learning could have on teachers' practice and on their day-to-day work. One of them suggested that ICT 'can even replace the teacher or to force the teacher to ameliorate her/his professional

status' (Head-teacher 7) and make them try more, since it demands greater efforts on their behalf. He added that 'we stay far from this tool on purpose: to have our calm and to avoid problems'.

Some principals mentioned the pupil-centered lessons that ICT use imposes on teachers. As one of them said, it does not simply demand a change in teachers' practice, but it also motivates all pupils and strengthens their willingness to participate in the learning process:

We abandon the teacher-centered perception of learning and we go to pupil-centered.

(Head-teacher 8)

Some head-teachers could not identify any disadvantage in the use of ICT and said 'Disadvantages? I cannot see any for teaching. It is very useful' (Head-teacher 5), others disagreed. Some ICT experienced head-teachers, especially in physics or mathematics, observed: 'In physics you can do a simulation and that can substitute an experiment... but the skills are not developed only by looking at a computer' (Head-teacher 9).

6.4 The Impact of EE ICT Training

Most of the head-teachers judged the effectiveness of the EE ICT training provided on the basis of its results and the impact it had on their school's culture and life and they said that teachers' practice had not changed at all after the training. Some head-teachers refused to comment at all on the impact of EE since, as they said, they have no knowledge of what teachers do in their classrooms.

More specifically, one of the head-teachers said that 'the teachers must have liked it, although they didn't say anything. Otherwise they should have abandoned it, because they wouldn't stay there for one year' (Head-teacher 3), but others expressed more considered views on it. Two head-teachers that could actually comment on the teachers' impressions about the training stated that the teachers spoke of it as being positive, but they confessed that they did face difficulties when trying to apply what they were taught. One head-teacher commented negatively on the planning of the TSC training programme and appeared to consider that its duration of 45 hours was not sufficient to fulfil its aims and to cover the needs of the teachers who attended it: 'they did 45 hours. For someone who had never seen a keyboard in her/his life 45 hours training means nothing? Who are they making fun of? We are old people' (Head-teacher 7).

One of them said that there was no change in the work of teachers of his school as result of having undertaken the training; that the teachers did not use ICT, but that they might have started using other teaching methods and 'they give worksheets, while before they didn't know what a worksheet is' (Head-teacher 8).

Some others said that they did not know what their teachers were doing in their classrooms since they did not 'attend lessons' and did not assess their performance (Head-teacher 5).

Although the training aimed to enhance the cooperation between the members of school staff, it did not seem to have succeeded in this. One head-teacher talked about extended cooperation between teachers, teacher-trainers and the IT teacher saying 'teacher-trainers were teachers in schools and they come often. Whenever the teachers need something they

ask the IT teachers. They have their help' (Head-teacher 5). Another mentioned the cooperation of some teachers which aimed at the production of a school magazine and noted that 'all these were done on the school's computers' (Head-teacher 7).

But the majority of school head-teachers recognised that there was no cooperation at all in their schools regarding ICT. The main reason they mentioned for this was a lack of time:

Teachers cannot co-operate outside the school...Where would they find the time? You can't do it losing valuable time.

(Head-teacher 2)

6.5 Factors that Make Teachers Avoid Using ICT in Subject

Teaching

The head-teachers who participated in the research felt that none of their school's teachers who had attended the EE ICT training programme, except in two cases, used or expressed the will to use ICT in subject teaching and identified some reasons for their reluctance to exploit what they had learned during the training course. The most serious of them were: the lack of the appropriate infrastructure, due either to lack of support from the Ministry or to frequent vandalism that often happens in schools; the demands of the curriculum, which leaves teachers no freedom to spend some time on aspects not closely related to the exams; the lack of support, that makes teachers to feel helpless without technical assistance and guidance in planning lessons with ICT, the general culture of the Greek school and the

teachers' unwillingness to develop professionally; and the school being seen as a preparation stage for exams leading to University.

6.5.1 Lack of the Appropriate Infrastructure

Some head-teachers tried to explain why they did not attempt to equip their schools with the necessary infrastructure. According to them many thefts were taking place in schools, while pupils themselves were not respectful of the school's property. So the machines easily vanish or get damaged, and it would be quite difficult to replace or repair them.

According to the head-teachers' the culture that prevails in many Greek schools, and the fact that the head-teachers cannot leave anything unlocked or unattended, is a serious reason why they are not interested in equipping schools with the necessary infrastructure.

One head-teacher's description is quite revealing on this point:

We decided to buy a DVD and put it next to the video. In one week the DVD was gone...There is a culture of destroying in Greek schools. I have a teacher doing technology, a subject that demands a relevant computer suite. It's funny to say that you are teaching technology with a blackboard and a chalk. And you see her each time lifting the machine and take it down as soon as she finishes, because they (i.e. the pupils) will start playing with it. They will see it like a game. It's sure that they will do something to destroy it.

(Head-teacher 4)

Some head-teachers suggested another reason for not wanting to equip their school was lack of appropriate guidance and support. Some of them appeared not to have any

information about which software to buy and they complained of not being guided on this point by any agent. A head-teacher said:

There are too many programs, which are very expensive, and I can't go and choose them.... There is no good guidance.

(Head-teacher 7)

In fact, there was only one school that had an extra computer suite, because a mathematics teacher asked for it as head-teacher 9 mentioned.

Head-teachers said that they do not interfere with their teachers' work and they did not really know what was happening in their classrooms. They said that they were not negative towards the use of ICT, but they stated that they could not ask their teachers to use ICT, 'because it's like interfering in their work...And I believe that, if you impose something on someone, it usually does not work' (Head-teacher 5). The same head-teacher said that 'there is a computer suite with all the equipment and if they want they can take the pupils there...It's a completely personal issue'.

Some head-teachers felt that on the one hand, the available infrastructure was inaccessible and, on the other, that 'if the teacher knows that in the class s/he enters s/he will find all these machines and, besides the material they themselves prepare, additional material sent to school... they are going to use ICT' (Head-teacher 4).

Only one head-teacher mentioned www.e-yliko.gr, which he had learned from other sites and which he used as a link, and referred to the role it could play in improving the teaching and learning process.

More than half of the head-teachers seemed to prefer a classroom that would include all the necessary equipment, which a teacher could make use of in her/his teaching any time s/he needed it without any time-consuming pre-arrangement. As a head-teacher said:

All these things that ameliorate education should exist in the classroom and any teacher who can use them should just press a button and make use of what s/he has prepared.

(Head-teacher 4)

6.5.2 Lack of Time

Many head-teachers seemed to believe that 'the reason why many teachers do not use ICT is the pressure of time' (Head-teacher 3) and some proposed that they should be provided with the 'time for preparation... to get away from teaching for a while in order to feel comfortable with teaching with IT' (Head-teacher 3).

Head-teacher 1 agreed with this suggesting that a secretary could release teachers from their clerical duties and help them to get some free time to invest it in practising what they had learned.

6.5.3 Lack of Support

More than half of head-teachers saw the provision of technical support as one of the basic needs of teachers intending to make use of ICT in subject teaching, and one of them stated that they should 'have an IT teacher for every ten schools, to pass two hours from every school to give training to those interested' (Head-teacher 7).

Most of the head-teachers complained of not having any guidance or help from anybody in choosing software:

Advice from whom? The PI is inexistent. When someone creates a CD sends a notice saying that there is that CD. This is not guidance for me.

(Head-teacher 7)

One head-teacher declared that he tried to repair simple breakdowns or damage to the computers, because of lack of any external support and if it was something difficult, they 'call the company that guarantees the machine's operation, but it takes a lot of time' (Head-teacher 4).

Another head-teacher suggested that the consultant teacher could act as guide and motivate teachers to embed ICT use in their teaching. He said:

There can't be any pressure from me in the issue of teaching methodology. It could be done through the consultant. Not pressure, but guidance.

(Head-teacher 3)

Nevertheless, two headteachers maintained that without pressure nothing was going to change. One of them said that 'A teacher would never start practising alone. If it was compulsory, it would maybe work' (Head-teacher 1), while another (Head-teacher 4) expressed some reservations about such an attitude and the fear that 'forcing things upon teachers' practice would be considered 'authoritarian' by the teachers and some political parties as well.

6.5.4 The Demands of the Curriculum

Some head-teachers, especially those working in high-level secondary schools (Lyceums) pointed out the restrictions of the current curriculum and its connection with the examinations leading to the Universities. A head-teacher stressed this point saying about the teachers:

There is always the curriculum problem, because of the way that Lyceums work... Because they are not very used to it and there is the pressure from the exams, and as a result it [i.e. the use of ICT] is considered a luxury. (Head-teacher 6)

In addition, they seemed to believe that the existing available software, especially in the area of literature, was not appropriate and 'there should more material for literacy teachers in order to have ready schedules and more software' (Head-teacher 3).

6.5.5 The General Culture of the Greek School

Only head-teacher 4, who gave a deep description of the teaching profession and the Greek teacher's status, pointed out the main disadvantages of the educational system. He acknowledged that teachers in his school do not use computers not even for administrative tasks and explained: 'the teachers who are responsible for an administrative task here do it by hand. They also give everything to their pupils hand-written'. As he said, that happens either because they do not have the necessary free time to learn and practise or because they are fond of the traditional way of teaching.

Referring to himself as someone who tries to keep updated with the technology, even though he is close to retirement, he asked 'But why me? I am in the sunset of my career!'

He tried to explain and justify the attitude of his school's teachers and the lack of ICT use in their classroom saying:

Now as far as it concerns teachers; there are two categories of teachers. Those who have the knowledge and the will to modernise their teaching with new methods and those who might want it deep inside, those who can't and they don't know... You have to have it yourself.

(Head-teacher 4)

At the same time he complained of some deficits of the Greek educational system. He emphasised the few hours teachers are obliged to stay at school. In his words:

I was teacher, when it was compulsory to stay from eight till two in school... Now she (i.e. the teacher) will go at home, she has so many things to do, and I say 'she', because women are the majority here, 18 women four men.

(Head-teacher 4)

Continuing his description, the same head-teacher added that pupils and teachers as well perceive secondary schools, especially at the higher level, as an indispensable but useless step leading to the University:

The Greek system's ideology is that every high-school pupil should succeed in the exams leading to the University... But so school appears to be a process, and the pupils do care more about the private lessons at home than about the school... When the school is not perceived as necessary, then we have lost the game.

(Head-teacher 4)

The same head-teacher referred to the lack of evaluation, the conditions that do not favour teachers' professional development, and teachers' indifference towards school

improvement. He noted that a schools' progress depends on the will of a minority of teachers who are ready to spend some of their spare time in tasks beyond their teaching.

Nevertheless, he said that there could not be any evaluation at least concerning ICT since 'the teachers do not have the necessary equipment and training' and seemed to be suspicious of the persons who could eventually undertake this task.

6.6 Perceptions of Teachers' Motivation

Some head-teachers commented on the lack of any motivation given to teachers in order to attend the training and use ICT in their teaching afterwards and stressed its great importance in the uptake of ICT.

More specifically, some mentioned of money given to the participants by TSC as a good incentive and they complained that they were not given any motivation in general or a good enough salary to neglect their professional status. However, one head-teacher disagreed with giving money to teachers as an incentive to attend the training and buy a computer saying:

I am against giving money. Because if you want to see who really wants to learn, you will call him on a voluntary basis... And you see that it happens and with money. And most of them go there for the money.

(Head-teacher 4)

Another head-teacher felt teachers should strive for:

Moral satisfaction coming from the pupils' or from the head-teachers' responses. The teacher has no other incentive besides his own, that s/he is doing her/his job better.

(Head-teacher 8)

Another one, 5, reported that only one of the teachers of his school who attended the training course spent the money he was given actually to buy a computer. However, most of the head-teachers seemed to believe that money is an effective incentive and motivation not only for teachers but for the teacher-trainers too. The following comments are revealing on this point:

The money was a good motivation, and many bought or upgraded their computers. But many didn't do it. With the money they get, its natural... The head-teachers need incentives as well to cope effectively with all the troubles.

(Head-teacher 1)

6.7 Suggestions regarding improving the training

The head-teachers who took part in this research made some suggestions that could motivate teachers to participate in such ICT training programmes and enhance their ability to integrate ICT use in classroom. Most of them suggested that the teachers should be provided with a computer at home, in order to be able to practice, as well as further training in order to keep up with the evolution in the area of ICT in education. A few head-teachers who had been involved in the training suggested that a better learning environment should be created for the provision of the training while more opportunities for practising and observing ICT lessons should be given. Some of them also mentioned the importance of motivation.

6.7.1 Each Participant should be Provided with a Computer

One head-teacher (7) was very concerned by the fact that those responsible for the training did not provide the teachers who took part in the training course with computers. In fact each participant was granted financial support during TSC programme, but it was not enough in order for teachers to buy a computer. At the same time he blamed the Greek Ministry of Education for poor planning and not facing the problem properly. At the same time he proposed a way of solving this problem:

With 300 euros not only can't you buy a computer but not even the box. If we take under account that there were over 75,000 teachers who got trained, the party with the Ministry could have gone to a big industry to say that we need 75,000 computers the would be able to negotiate a price of 300 euros and every teacher would get a computer. Why didn't they do it?.

(Head-teacher 7)

Another head-teacher, 4, did mention that as teachers did not have computers at home. This meant that 'after a month everything ...will have been forgotten'.

6.7.2 Training should be a Continuous and Life-long Process

Many of the interviewed head-teachers recognised the need of continuous training and of life-long commitment for professional development. One mentioned the general problem of a lack of training for the teachers, which is connected to the low morale of the profession, and stressed the point that teachers do not care for their professional development after their graduation and that leads to the bad profile of the profession:

To be given a bachelor's degree is not the end of your work... You have to learn more. Each day things are changing.

(Head-teacher 7)

6.7.3 The Training should be carried out in the Appropriate Environment

The head-teachers who had participated in the EE ICT training programme spoke about the atmosphere within which it took place. One referred to the need for the creation of a motivating and secure environment and thought that the atmosphere of this particular training did not encourage the teachers and did not make them willing to continue the training, since 'they felt a fear of being made fun of... and embarrassed to say that they haven't understood something...' (Head-teacher 7).

Alluding to the need for such an atmosphere another head-teacher mentioned the positive role that a learning or professional community could play for the successful implementation of a school innovation or reform. He said that:

... if we create a kind of learning community, we will have the basic, and then new people can come from the universities, trained or half trained, and with these communities and the refreshment of the employees in a decade we will have something important.

(Head-teacher 8)

6.7.4 Greater Emphasis should be put on the Practical Aspect of the Training

That the training focused mostly on theory was noted by one head-teacher who happened to be teacher-trainer as well. He reported that:

The issue was to pass on new pedagogic perceptions under the umbrella of the new technologies...You try to connect the traditional things that the teacher is doing with the new ones in a roundabout way.

(Head-teacher 8)

Another head-teacher pointed out the importance of teachers observing exemplary methods of integrating ICT into teaching:

S/he should see how to accommodate that for some time or minutes in the traditional teaching and see afterwards if the result was better or not.

(Head-teacher 9)

6.7.5 Training should Create Incentives for Participation

According to some head-teachers many things in schools appear to work thanks to the good will of some teachers. But some recognised the need for incentives not only for teachers, but for teacher-trainers as well, who were promised to 'be promoted, to a level above the inspectors' but 'nothing happened' (Head-teacher 8).

One of them who had worked as teacher-trainer commented on the important role the consultants, the people from the authorities or the Ministry, could play in enhancing teachers' interest to take part in such training courses:

No consultant passes by, not a person from the administration, or the Ministry does say 'bravo for volunteering for that' or that 'I am awarding you that certificate'... They should show that they recognise the efforts of the teachers.

(Head-teacher 8)

6.8 Chapter Summary

In this chapter the head-teachers perceptions concerning the EE training and the educational use of ICT were investigated. This shed light on teachers' experiences too. The head-teachers did not seem to disagree with the teachers but they were able to offer more information regarding school culture and provide a context for understanding the EE training and its impact. In the next chapter, the teacher-trainers' point of view will be presented.

CHAPTER 7: DATA FROM TEACHER-TRAINERS' POINT OF VIEW

7.1 Introduction

In this chapter interviews with the teacher-trainers who carried out the EE ICT training programme are presented. The teacher-trainers interviewed were teachers serving in schools at the time they were selected and attended a special training programme to be capable to conduct the EE ICT teacher in-service training. These teacher-trainers gave valuable information on many topics of interest, such as their perceptions of the educational potential of ICT, of the process and the effectiveness of their preparation, of the realisation of the EE training programme and the problems they faced during the whole process, of its evaluation and the impact it had on schools' life, and made some suggestions for the improvement of ICT in-service training programmes.

7.2 Teacher-trainers' Perceptions about the Educational Potential of ICT

All three teacher-trainers appeared convinced of the educational potential of ICT and were great supporters of it, and brought examples of the positive impact ICT has on teaching and learning. One drawback all of them underlined was the lack of time in order for

teachers to make use of ICT, which could only be overcome with a general reform of the curriculum and change of beliefs.

More exactly, the teacher-trainers seemed convinced of the importance of ICT. They put into practice whatever they were told and they saw that ICT, properly used, 'could challenge the educational system and change thoughts prevailing for decades' (Teacher-trainer 2).

All three teacher-trainers were asked to express their own opinions about the impact ICT could have on the teaching and learning process, and they identified some basic advantages of its use. One of them said that ICT 'is a nice tool that can change your beliefs radically about the teaching and learning process' (Teacher-trainer 1).

Another teacher-trainer added that ICT use was very helpful for the pupils, because it 'promotes group work, and pupils get used to a model that they will find useful later in their life' (Teacher-trainer 2).

One teacher-trainer mentioned that ICT could reduce the gap between performance levels: the low level student performance and the high level one. He noted: 'In front of a computer all students are equal; the differences disappear...in such an environment the pupil changes and s/he gets traits that you could not see before' (Teacher-trainer 2).

A disadvantage of the use of ICT in subject teaching stressed by the teacher-trainers was the time needed. All of them agreed that preparing an ICT lesson needs 'too much time... with the computer with the danger of losing the lessons objectives' (Teacher-trainer 2).

A teacher-trainer suggested that he 'had to change their (teachers') beliefs' and tried to convince them that the computer is not only about surfing on-line and getting information, since they 'came with that impression' (Teacher-trainer 1).

The same teacher-trainer added that ICT could not only save time, but also offer something positive to the curriculum, but under some specific conditions. He suggested that if you 'get away from the tied timetables... have a good appreciation of the material... then you can save lots of time and do great things' (Teacher-trainer 1).

The teacher-trainers associated the non-computer use of teachers with the strict curriculum and the lack of time. They said that the teachers have to make progress in a predetermined curriculum and to meet its demands, and suggested that under the present pressure teachers cannot think of computer use. A teacher-trainer asserted:

It is too complicated. In order to go on with the curriculum the software must suit the relevant material. And the teacher must be aware... Books are changing, many new subjects are included in the material and corrections take place. All these press the teachers a lot ...

(Teacher-trainer 2)

7.3 Teacher-trainers' Preparation

The teacher-trainers referred to the training of postgraduate level they received in order to become teacher-trainers. It seems that they were satisfied as far as it concerned the IT part of their training, but dissatisfied concerning the educational part of it.

The teacher-trainers were selected by the Greek Ministry of Education after submitting an application on the basis of (i) their previous research and training activities and (ii) their knowledge and skills in using ICT. After the training provided by them to their colleagues T1 went to do a Master degree in 'theory, practice and evaluation of educational work', T2 went to work in a LEA, while T3 was the only one to go back to his school.

The teacher-trainers who took part in this study expressed opinions about the effectiveness of the training programme they received. One of them appeared to be quite satisfied especially with regard to the 'issues of educational use of computers' (Teacher-trainer 1). In contrast, another teacher-trainer said about their educators: 'Those who had the responsibility to pass to us their knowledge about the pedagogical theories didn't do their job well' (Teacher-trainer 2). Teacher-trainer 3 found a silver lining in reading more books as he found the training '50% satisfactory' and he was reading books alone (Teacher-trainer 3). He had a negative stance towards the training, but he was soon convinced about the contribution of ICT to subject teaching.

7.4 Information about the Carrying-out of the EE In-service Training

The teacher-trainers referred to several problems they faced. The main ones were the difficulties they had in accessing schools because of the negative or disinterested stance of head-teachers and teachers as well towards the training.

7.4.1 Problems related to its Preparation

The teacher-trainers were asked to comment on the problems they met in their effort to carry out the EE ICT in-service training programme. They focused on their visits to schools and their contact with teachers and head-teachers and their stance towards them. They felt that they had to visit the schools themselves in order to inform the teachers about the particular training programme, to explain its aims and its importance and to persuade them to take part in it. They all faced difficulties:

I. The stance of the head-teachers

The schools had computer suites prepared especially for the training, but when the teacher-trainers visited the schools they realised that some head-teachers had no idea about the existence of this particular training programme. At the beginning they were denied access to the computer suites, and faced arguments about financial responsibility and availability. In the end the teacher-trainers found ways to persuade the head-teachers to cooperate. The head-teachers of secondary high schools (Lyceums) had been especially unhelpful, because of the demands imposed on teachers by the curriculum, while the more helpful and cooperative were head-teachers who had knowledge of ICT use in education. The comments of a teacher-trainer are clear on this point:

In the first year, when we suddenly appeared in the schools who had optionally chosen to participate in the training programme... although these schools had a computer suite for the training, they were not aware of the scheme... The head-teachers said 'the school is financially responsible for the computer suite, who will open it for you, who

will be in there, who will be responsible for the security etc?'... I faced such attitudes only at the first visit of the school. Things got better during the second meeting.

(Teacher-trainer 1)

II. The attitudes of teachers

Teachers were not ready to accept the new reality and the new roles the use of ICT imposed on them. They had to be persuaded about the potential of ICT to improve subject teaching and the pupils' learning. One teacher-trainer described Greek educational reality. The fact that 'there is no moral reward for what a colleague is doing... that's a disadvantage of the Greek education' (Teacher-trainer 1). He added that it depends exclusively on the teachers' will to learn. On the other hand 'they recognise other things that do not have to do with education, it has to do with social relationships and maybe these are more valued' (Teacher-trainer 1).

One teacher-trainer connected these problems with the lack of a 'legislative framework' for their work and talked about lack of good management. He complained that their status had not been clearly defined and 'there was not any Minister's decision that mentioned anything like that' (Teacher-trainer 1). One teacher-trainer considered that the EE ICT training programme was the initiative of one or two ambitious people and, when they left, the programme deteriorated, 'that's how it happens in Greece. The people disappear and the programme stops' (Teacher-trainer 3).

7.4.2 Problems related to the Programme's Realisation

The teacher-trainers referred to some problems they met during the phase of carrying out this particular ICT training programme. These problems were related mostly to the lack of appropriate infrastructure since the computer suite was always occupied, to technical problems concerning the Internet connection and the network function, to the software, which was not appropriate and to e-yliko, which was not satisfactory. There were also problems caused by the lack of support from the IT teacher, who was not willing to help the teacher-trainers in technical problems, from the head-teachers, who did not encourage ICT implementation, and the Ministry, which was not offering any guidance or feedback at all. The teacher-trainers considered also problematic the fact that they had been colleagues with the teachers and said that this led some teachers to not take the teacher-trainer seriously. A final problem teacher-trainers underlined was the differentiated IT skills of the participants which made some of them lose track of the training and even give up.

I. The lack of access to the computer suite of schools and of appropriate infrastructure

The teacher-trainers complained 'because the computer suites were occupied by the pupils and they could not use them out of schedule hours', since the IT teacher is responsible for its function even from the financial point of view. They felt that the IT teacher was usually reluctant to permit the teachers who were receiving the training to use the computer suites (Teacher-trainer 2).

The teacher-trainers regarded the computer suite as the best environment for teaching with the use of ICT, mainly because 'only there they [i.e. the pupils] can experience all the advantages of group work and even that of groups working in competition with each other' (Teacher-trainer 2). For that reason they would like a second computer suite, so that the lack of resources would not be an obstacle to the teachers' willingness to use ICT.

They also referred to the Internet 'not working and the computers... of low power and when on the network...slow' (Teacher-trainer 1) and, as they mentioned, this would be even more problematic if a classroom of pupils were working there. They asserted that, when they met minor problems, they were able to solve them, but problems related to Internet were beyond their knowledge and skills.

The teacher-trainers' comments on the software available were similar. They admitted that 'the software... it's useless in great part, closed, that does not leave freedom in the thinking, and does not move in the area of searching' (Teacher-trainer 2) and made it difficult for them to train the participants to the use software in their teaching. The teacher-trainers' viewed e-yliko website similarly. They demonstrated and supported it, because 'it was good at the beginning, but it was only for those who had attended the training and actually the good ones'. He hinted that he was disappointed by the way e-yliko had been embedded in the training process, but he was not willing to give more information. He said: 'For sure it's good, but it has nothing to do with our EE' (Teacher-trainer 2).

II. The lack of support

(i) Issues with IT teachers

As seen, a teacher-trainer complained about the IT teachers who were not helpful at all. The IT teachers were not cooperating with the teacher-trainers as far as using the network was concerned, and caused problems and put obstacles in way of accomplishing their training duties successfully. A teacher-trainer stressed that point saying:

I was installing the software and next day it wasn't there, because I was doing it as a user. I was not given the password.

(Teacher-trainer 1)

These problems made the teacher-trainers suggest that the teachers and themselves as well would need 'a technician to solve the problems on the spot... You cannot leave the teacher without support' (Teacher-trainer 1). He said that there was a technician in the school only at the beginning of the training that was quite helpful.

(ii) Head-teacher' attitudes

Another factor that did not contribute to the normal development of the training course was the support provided to the teacher-trainers by the head-teachers of the schools in which the training programme took place. One teacher-trainer said that the head-teacher put obstacles to the teachers in the use of the school's computer suite, because he thought that the less they used it the better. A teacher-trainer observed 'but it's not fair, since even the

IT teacher does not have the technical knowledge to respond to these issues' (Teacher – trainer 1)

Another teacher-trainer said that in the cases in which the head-teacher was cooperative and helpful 'the teachers were more focused on the training and the IT teacher as well more responsible' (Teacher-trainer 3).

(iii) Issues with the Ministry of Education

The teacher-trainers felt that lack of support was the main reason that made many teacher-trainers all over Greece abandon their training responsibilities and go back to their schools. The teacher-trainers thought that working in school was much easier... 'And the salary was the same' (Teacher-trainer 2), so they returned there.

As part of their training, the teacher-trainers had to send reports to their educators and to the Ministry about the progress of the training and the problems they met, but they had 'feedback only in the first year' (Teacher-trainer 1).

They noted that they had to cooperate with each other through an e-mail list, since there was no other support, 'because there was a need to exchange experiences. Otherwise we would get lost'. What the Ministry offered them was just two day-seminars 'because there was no money', which the teacher-trainers found very useful, but not sufficient (Teacher-trainer 2).

The teacher-trainers suggested that the same lack of support applied to the teachers also, since they were not being assisted at all in performing their new role by any internal or external agent after finishing their training. The teacher-trainers implied that without further support 'after 3 years we will forget even that new technologies exist' (Teacher-trainer 1).

According to the teacher-trainers only a few teachers were using ICT in their teaching, which they regarded quite remarkable, because 'they don't get help from anywhere' (Teacher-trainer 1).

One teacher-trainer suggested that the teachers needed an advisor in the area, so that they could ask for help on issues of pedagogy and planning. According to a teacher-trainer the teacher 'needs to know that, if s/he decides to get in the computer suite, there will be someone to support her/him, as an advisor of subject... the teachers will use ICT in their classroom, if they like it, but, if they face difficulties, they will surely give up' (Teacher-trainer 1).

III. The nature of the participant teachers

Two out of the 3 teacher-trainers said that the fact of knowing the participants beforehand was making their task more difficult. Two of the teacher-trainers coincidentally worked in the same school or in the same area with their teachers. The familiarity that existed between the teacher-trainer and the teachers made them show less respect towards their teacher-trainer and often, to not complete their tasks, treating the teacher-trainer as a

friend. On the other hand there were those teachers who had a 'certain impression of what you are to tell them' and questioned their ability as teacher-trainers (Teacher-trainer 2).

IV. Lack of an appropriate curriculum and timetable

An additional difficulty was the lack of a common curriculum relevant to the aims of the particular ICT training programme. The teacher-trainers had to plan the structure and define the content of the training themselves in cooperation with the teachers and the head-teacher of the school in which the training took place. The body of teacher-trainers tried to form a common programme, but it was difficult to plan it. They appreciated the lack of restrictions and the right given to them to delineate the framework of the training, but it proved to be quite difficult, because they had a differentiated audience and did not have the necessary experience and after all 'the important thing for the teacher-trainer is to find the middle way for everyone and apply a programme that responds to the needs of most of the teachers' (Teacher-trainer 2).

In fact, the content of the training and its delivery was basically decided by the teacher-trainers. 'Two to three lessons in the whole year were just for technical issues'. The trainees focused on pedagogy, although 'some of them wanted to get more IT skills, but the programme had not just this intention' (Teacher-trainer 1).

Similar problems were caused by the timetable of the course. The timetable was chosen 'to suit the teachers... in cooperation with them' (Teacher-trainer 1) and in cooperation with teachers and head-teachers the training courses took place outside school hours to avoid

the disturbance of school life, and sometimes during school hours after reform of the school timetable. But this timetable could not satisfy the needs of all participants. 'Since everything was optional and on a voluntary basis and the training activities took place in out of school hours' this made it difficult for teachers to participate and 'some teachers thought of leaving the programme without completing it' and some really did leave (Teacher-trainer 2).

V. The differentiation of knowledge and skills of the teachers

The teacher-trainers tried to select teachers with some IT knowledge to participate in the training and to form their groups, but that appeared to be a difficult task. So the groups they formulated consisted of teachers with different level of ICT knowledge and skills. A teacher-trainer explained:

We were trying to call in people that had the basic knowledge ...we had to choose and we preferred experienced users. But after that you could see that their ICT knowledge and skills were not the same. This differentiation caused us some troubles.

(Teacher-trainer 1)

This differentiation of level of ICT knowledge and skills meant many teachers wanted to leave the training, because they were facing difficulties with the IT part. The EE ICT in-service training focused mainly on educational and pedagogical issues 'the programme was too difficult for them, because it was something totally new' (Teacher-trainer 1).

Another reason that made teachers leave the training was that they were not familiar with that approach, since they had to 'prepare things for next time, to cooperate on the spot in

pairs; to work in a way in which the Greek teachers were not used to working' (Teacher-trainer 1).

This led the teacher-trainers to suggest that the TSC training programme should precede the EE training programme and that teachers should attend training on IT skills first:

In TSC they were getting used to computers...TSC should be at the beginning.

(Teacher-trainer 3)

A different view about the TSC was expressed by the teacher-trainer 2. He said that this training programme simply confused things and had no real purpose; that it was a programme fitted with the Ministry's plans 'only to show that there was large-scale training' (Teacher-trainer 2).

7.5 The Evaluation of the EE ICT Training Programme and its Impact on School Life

The teacher-trainers accepted that the training failed to succeed its main aim: to change the pedagogy of teachers concerning their teaching methods, to encourage collaboration among them and to end up with ICT implementation. The teachers seemed to attend the training because they simply wanted to acquire IT skills and only few of them did practise lessons with ICT during their training and even fewer did any after the end of the training.

More exactly, although the training programme had clear aims, many teachers 'saw it as a chance to learn IT skills and to learn the basic tools. During that, they found out that there

is something else more important...what s/he is going to do with the use of it...' (Teacher-trainer 2).

The teacher-trainers felt that the teachers complained mostly of lack of appropriate material to read from, of the poor quality of the infrastructure available and the lack of heating in the computer suite in which the training was carried out, but in general, 'they seemed to be satisfied with the general result of the training' (Teacher-trainer 1).

One of the negative points and deficits of this training programme was, according to the teacher-trainers, the stance of the teachers towards the lessons which they had to perform with the use of ICT in the framework of their practice. The teacher-trainers appeared to recognise the necessity and importance of these lessons. As a teacher-trainer noted:

If they did not see it working in practice themselves, I don't think that it would benefit them.

(Teacher-trainer 1)

In spite of this, the lessons incorporating ICT that took place during the training process were very limited. The teacher-trainer 1 acknowledged that 20-30% of his teachers undertook to carry out such a lesson, the teacher-trainer 2 felt that two out of 50 teachers the first time and five out of 40 teachers the second time realised these lessons and teacher-trainer 3 asserted that all the teachers did it. As it seems from the teacher-trainers' comments the main reason for doing such lessons was that; 'one lesson was enough for them to get the certificate' (Teacher-trainer 3).

One teacher-trainer talked about two groups of teachers: the first consisted of those teachers who felt that 'they were doing better things than they used to', although always with the teacher-trainer's guidance, and the second consisted of those teachers who appeared to feel a bit disappointed, because the structure of the classroom was different and they might give the impression that they were not doing their job properly:

We were trying to tell them [i.e. the teachers] that the work that was being done and the way it was being done was more important than simply reading their pupils 'poems', which I don't know if they were listening anyway.

(Teacher-trainer 1)

When these lessons did not happen the teacher-trainers saw themselves as somewhat responsible for it. One teacher-trainer said that he 'could not support so many lessons' because he did not have the time to prepare these lessons sufficiently and added that even the best teacher had to meet the teacher-trainer at least twice in order to organise such a lesson (Teacher-trainer 2).

The teacher-trainers also referred to the impact lessons with the use of ICT had on pupils and the way they responded to it. One teacher-trainer underlined that most pupils could use computers better than their teachers and that they found it fascinating to see that they are better than their teachers in some area. As a teacher-trainer observed 'That's another reason why the teachers felt uncomfortable in the computer suite' (Teacher-trainer 1).

One of the teacher-trainers was more specific and talked about the lack of interaction and collaboration on a conversational level between teachers and pupils. He said:

The teacher... has to be involved with the pupils on a different level, on a conversational level... We don't have the patience and we think it's a waste of time to let pupils think and talk and even say their stupid things at the very end.

(Teacher-trainer 1)

The teacher-trainers observed that pupils 'in the first 5 minutes might laugh, because they see something that they haven't seen before and they think that they will play' (Teacher-trainer 2), but they seemed to work well soon. A teacher-trainer suggested that effectiveness in teaching with ICT lies in having prepared the appropriate worksheet that will attract the pupils (Teacher-trainer 3).

Another negative element of the training referred to by the teacher-trainers was that, although they 'were trying to show them [i.e. the teachers] that they had to cooperate between themselves', this did not happen. Teachers did not seem willing to cooperate with their colleagues and they did not prepare the tasks they were supposed to, although they were 'from the same school or... a neighbouring school' (Teacher-trainer 1).

The teacher-trainers felt that the training's primary aim was 'to replace the current teachers' perception that in a classroom the teacher must talk and the pupils should listen' (Teacher-trainer 2). They said that the teachers had different perceptions about the role of pupils and of teachers and the relationships between them within the educational environment, and that 'the computer is the excuse for teachers to change something in the classroom' (Teacher-trainer 2). In some cases, they felt they did succeed in having teachers reflect on their pedagogy.

7.6 The Teacher-trainers Suggestions

The teacher-trainers suggested that ICT in-service training should be part of a general initiative of professional development, which would aim to the change and improve the teaching profession and the teaching and learning process. The necessary conditions of work should be established in order for it to be reasonable to ask teachers to use ICT in their teaching.

A teacher-trainer mentioned that there should be an additional training that could convince heads and teachers about the potential of ICT use and the positive role it could play in changing schools and enhancing the teaching and learning process. He also proposed that the training should be a continuous process, because the teachers and the schools' principals do not have a culture of continuous lifelong learning and they are not positive towards change. A teacher-trainer thought that this would be the baseline for effective training planning:

And then there are things like the old perception of head-teachers, the unwillingness of the teachers, the lack of training. We need first another training related to our identity, to the nature of our function, to our role in the new age. It's not possible only one teacher-trainer to do that and persuade so many people to cooperate with him.

(Teacher-trainer 2)

The same teacher-trainer mentioned that the use of ICT could not be compulsory, because the necessary and appropriate conditions do not exist in schools. As an example of this he referred to the lack of a second computer suite 'because many teachers wanted to practise

after the training, but there was no a computer suite available in schools' (Teacher-trainer 2).

7.7 Chapter Summary

In this chapter, teacher-trainers underlined the problems they met during their training and the training they provided to the teachers. They reflected on the procedures and outcomes mostly of the EE training and they suggested methods of enhancement of its impact. In the next chapter, the perceptions of three people involved in the planning, implementation and sustaining of the EE and TSC training are presented.

CHAPTER 8: DATA FROM PROGRAMME DESIGNERS' POINT OF VIEW

8.1 Introduction

In this chapter the data gathered through interviews with the programme designers are presented. These refer to several issues related to the planning and the implementation of the TSC and EE ICT training programmes and their experience collected from their continuous dealing with the teacher-trainers and the evaluation of the results of the training projects that were used.

8.2 EE and TSC Programme Designers' views of ICT in-service training

The programme designers referred to the different training programmes already in place and criticised the existence of two different training programmes at the same time. The main reasons for the failure of the training to have a considerable impact were the training's decentralised form, which could not endure within the general centralised form of education, as well as the lack of a secure framework for the training's existence and the interventions of the political authorities.

One referred to the decentralised character of the TSC ICT training programme as regards its 'planning, organisation, realisation and expenditure of the needed money' and noted

that the Ministry of Education and the Pedagogical Institute put some principles as regards its 'content, the qualifications of the eventual teacher-trainers, the centres where the training was to be carried out' and the security of the 'appropriate mechanisms for the evaluation of its effectiveness and the provision of the necessary support' (Programme designer 2). The decentralised form of the training (i) permitted each teacher to participate in whichever stage P1, P2 and P3 of the training he wished, (ii) arranged things in a way that 'each school could decide how and where their teachers would be trained irrespective of the school in which they served' and (iii) made the school which was the centre in which the training was taking place responsible for the financial support.

The same programme designer alluded to the difficulties included the decentralised approach, because, as he noted, they 'haven't learned how to act in a decentralised way without complaining, because they are afraid when given responsibilities'. He confessed that 'the decentralised model did not work the way we designed it' and that 'other factors which interfered spoiled it' and 'the money given was spent according to the centre' and concluded that 'only the P1 stage of the training was completed, and it was not meant to happen like that' (Programme designer 2).

Another programme designer commented on the problems arising from the centralised form of educational change and innovations and the incorporation of a training programme into the framework of Ministry's wider programmes. One problem was that the programme designer could not be present in every training event and could not see through the accomplishment of the initial idea (Programme designer 1).

The first programme designer alluded to another deficit of the planning and implementing of the EE ICT training programme. He said that, because the person who introduced the EE ICT training programme had to withdraw at some point, 'the Ministry of Education continued it by itself with a person who happened to be there without spending the necessary money'. This programme designer considered the programme 'good' but 'small scaled', since 'around 1000 people were created in zero time, and the Ministry... transferred those from the school to the central authority, because they had to find a way to pay them and each one of them had to train some schools'. He stated that the EE training gave him the experience needed to design the TSC ICT training project (Programme designer 2).

The second ICT training programme designer disagreed with the co-existence of EE and TSC ICT training programmes. He recognised the fact that TSC training programme was part of a bigger training plan, but he argued that these two separate training programmes were not meant to work simultaneously. TSC ICT training programme was, according to him, a quick way of teaching IT skills, although that was not supposed to be its major aim. The programme could have impact, 'if the other two happen as well (P2 and P3), then we could say that it will have results. And if the teachers have bought the computers they were meant to' (Programme designer 1).

It was observed that for the time being all these programmes were offered independently and with no connection to one another. So the teachers were learning IT skills, but not how

to use these in the classroom. Programme designer 2 argued that 'these things should be happening simultaneously'.

The same view was expressed by the third programme, designer 3. He felt they 'should show to the teachers how to use Word or Power Point for their subject...', and explained that the problem was that there were not enough teacher-trainers who could provide ICT training in large-scale training programmes, while there were many IT teachers who could act as IT teacher-trainers.

The same programme designer felt in principle the programme should have worked out. The lack of a 'stable framework' and the political authority's intervention 'destroyed' all the hard work that had been done so far.

Regarding the end of the programme (see 1.5.2), one of the designers (2) seemed to regard that the abandonment of the programme was simply a political decision moving around the Ministry', 'although the Minister was enthusiastic about the programmes' and expressed a disappointment about what happened.

Another programme designer (3) gave a different explanation for the end of EE ICT training programme and argued that it stopped, because something 'more complete and large-scale' was being planned. She added that in the event nothing new happened and the EE ICT training programme ended without succeeding in its basic aims and even the test for the certificate that was to be given to the participants never happened. The same

programme designer spoke of a prevailing general feeling of disappointment concerning the ICT in Greece and put the blame as follows:

The problem of ICT training is the top of the cold mountain of the lack of training in general. Many years the only training is provided by PEK (i.e. Peripheral Training Centres) to newly appointed teachers for a week. Everybody considers it as a 'torture' that they have to go through in order to make their job more effective and easier. They don't believe that they gain anything.

(Programme designer 3)

The same programme designer (3) expressed the view that the training should have lasted longer 'three to four years' and noted that this is why the participating teachers 'whether they could attend it for second year'.

Programme designer 3, furthermore, talked about Greece as not being active as a country as far as ICT was concerned, although, 'we have the human potential resources, but we cannot still exploit it'. She blamed the educational system for that saying that 'two generations of pupils will be basically e-illiterate and unable to face what happens around'.

The same programme designer mentioned that those responsible never evaluated the EE ICT training programme and argued that, although some questionnaires were distributed to the people who attended the relevant training course, it is not known what happened to them.

8.3 The Impact of the Training Programmes on Schools' Life

The programme designers suggested that the great majority of the teachers do not use ICT in their teaching and these designers expressed their dissatisfaction with the training programmes that took place.

A programme designer noted that less than 2% of school time is spent by the trained teachers in educational activities and lessons incorporating ICT, while 20% of the time was the target and foresees that 'the one hour per day presence of pupils in the computer suite might not happen, and we might go straight to the time where each pupil will have a personal computer' (Programme designer 1).

Another programme designer (3) underlined that Greece lies behind the EU countries as regards the usage of ICT in schools. She asserted that there are not more than 50 teachers all over Greece using ICT in the teaching and learning process.

The same programme designer said that computers are used mostly for the Internet, since the software is not appropriate or sufficient, and that the way it is used does not allow teachers and pupils to take advantage of the great possibilities that it can offer, since 'what happens often is that there is a search of some passages on the net and the pupils are combining them. That's a pity. To use a massive gun to kill birds' (Programme designer 3).

8.4 Conceptions of Programme Designers about the Problems related to the Training's Realisation

The programme designers referred to the problems that arose during the training's realisation. They underlined that although the selection of teacher-trainers was good, the training itself lacked good organisation, there was not enough guidance from the Ministry to the teacher-trainers as well as not sufficient infrastructure for the training to be successful.

A training programme designer (1) appeared to believe that the selection of the teachers who were to be trained and become teacher-trainers was very 'good'. There had been no political interference and the training was appropriate in principle.

However programme designer 3 remarked that the guidance given to teacher-trainers was not sufficient; 'it was the beginning of everything and things were not clear. In addition to that, there was lack of organisation and coordination. This followed on so that when the teacher-trainers went to schools, there were no computer suites and no software and they were 'teaching with the one computer being located in the head-teacher's office' (Programme designer 3).

The same programme designer commented on the lack of the appropriate material. Although the EE ICT training programme let them free to plan their training, 'there should be at least some general principles. If someone liked or preferred just one piece of software, s/he was teaching that one the whole year'. (Programme designer 3).

Programme designer 3 talked also about lack of feedback. She saw that the teacher-trainers were communicating only on-line which sometimes caused misunderstandings, 'meeting on-line is ok, but face-to-face is different'. She confirmed the problems related to the inappropriateness of the computer suites in which the training was taking place; 'the place was a problem, because we were working evenings, and who would be responsible for the keys. We had no radiators'.

Programme designer 1 also talked about the difficulties they faced at the beginning of the training and alleged that it was not easy to co-ordinate the training of teacher-trainers, the computer suites and the software production.

Programme designer 3 referred to the lack of the appropriate software as well, a factor that caused problems in the training of teacher-trainers. She admitted that there was no good quality software and that the existing software did not meet the needs of teachers or of the training in general:

I think the software we had was for maximum 6 hours use in the schools

(Programme designer 3).

The programme designers' comments on e-yliko were similar. Programme designer 3 reported that, 'it started as a request of the teacher-trainers to bring together all the material. At the beginning the teacher-trainers had websites. Everybody had one and they put on the teachers' material. And we were exchanging things. Then we thought best to put them together'. This programme designer complained that the would-be teacher-trainers did not really promote and did not develop it during the training.

8.5 Programme Designers' Suggestions for Good Practice within ICT In-service Training

Apart from their general observations related to the planning and executing of the EE and TSC ICT training programmes the programme designers made some explicit suggestions and identified some presuppositions for successful implementation of ICT in subject teaching. The most important of them were: the existence of an active and appropriate school head-teacher, the participation of many teachers in the training programme from the same school, the provision of the necessary technical support, the provision of teachers with the necessary tools and the changing of teacher beliefs.

8.5.1. The Need for an Active and Appropriate School Head-teacher

A programme designer emphasised the important role the school head-teacher could play and noted that, when the head-teacher is positive or is included in the group of teachers, 'everything flows more easily'. In cases where the head-teacher was not cooperative, 'they were blocking the use of computers...' (Programme designer 3)

8.5.2 The Participation of many Teachers in the Training Programme from the same School

Programme designer 3 emphasised the importance of cooperation between teachers for the integration of an educational change in schools. According to her, it could be a positive thing that the teachers were of different levels of IT knowledge and skills.

We never had classes with levels. They were mixed and maybe it seems like a problem, but if we want to create a community in which each helps others that's a way as well. I put them sitting novice with experienced and it worked with me to have a group with three to four teachers from the same school.

This programme designer appeared to believe that the teachers who took part in the EE training programme had started getting used to cooperating, but after the programme in most cases this cooperation stopped.

8.5.3 The Provision of the Necessary Technical Support

One of the programme designers, 1, said that the compulsory teaching with ICT was not possible, since there was not an appropriate infrastructure. According to him educational innovations cannot be imposed or be compulsory, but should be optional, and argued that only, if the training expands to around half of teachers, then it would be possible to compulsorily ask them to use the knowledge and skills acquired during the training course:

If we say to do it now, the answer will be but we have no computer suites, they are occupied, not working. I don't think you can apply innovation with compulsory elements, but it could work with encouragement.

(Programme designer 1)

The same programme designer argued that ICT use in subject teaching could not be successfully implemented, unless there is continuous encouragement, good organisation and technical support saying, 'schools they need encouragement, appropriate arrangements and continuous technical support and more specific proposals' and argued that teachers need to be sure about the support they will be given or they will give up.

The need for technical support as a factor that may encourage teachers to embed the use of ICT in subject teaching was also suggested by the programme designer 3 who added that, if an element of audit was included, then more might be done and that the presence of inspectors in schools would be helpful:

Maybe, if we had a seminar to inform the inspectors and then start the programme, it could have been better... Since the leadership and administration do not encourage them, why should they do it?.

The same programme designer 3 talked about the need of an advisor's presence 'to whom they can turn to for answer' and 'who can be available some hours per week to discuss'. They had not been able to do this, because of lack of money.

8.5.4 The Provision of Teachers with the Necessary Tools

Programme designer 2 pointed out the need to provide teachers with the tools in order to be able to use ICT. That is why money was given to the teachers on the TSC programme to purchase a computer or upgrade their own. However, the method of distributing the money was flawed since they could not check what was being bought: 'I thought we could give this money through the banks, because they could check what is being bought...now they do whatever they want with it, and that creates wrong impressions' (Programme designer 2).

8.5.5 The Changing of Teacher Beliefs

Programme designer 1 suggested that it was quite difficult to implement ICT in the schools with the teachers who are there now and noted that 'changes in education are happening

with generational change and that ICT in education is 'a societal need and it's going to happen'.

Programme designer 3 pointed out that teachers had been working for many years and have been used to teacher-centered teaching approaches, 'to be the center of attention of the pupils and that now they are implicated in a quite different way of teaching within the computer suite 'where they already feel stressed, because they can't control everything'.

8.6 Chapter Summary

This chapter included the perceptions of policy-makers of the training programmes and their suggestions for enhancement. The following chapters present an analysis of the findings in the previous three chapters.

CHAPTER 9: THE ANALYSIS OF DATA

9.1 Introduction

In the previous chapters the perspectives of the teachers, head-teachers, teacher-trainers and EE and TSC programme designers were described. This chapter seeks to combine and analyse these perspectives, offers a triangulation of findings and to highlight any difference in perspective. The chapter presents first the perspective of each group of participants and then takes the key findings and looks for causal connections among them. These are presented in a concept map, which is summarised in the text.

9.2 Collated Findings

Table 9.2 shows the main findings arising from the previous four chapters and the perspective of each group of participants on the findings. This has the advantage of presenting 'a full data set in the same location' (see Miles and Huberman, 1994, p. 91-92).

The table is based on both questionnaires and interviews for the teachers' perspective and interviews with teacher-trainers, head-teachers, and programme designers of EE and TSC.

It is a combination of a checklist matrix and a role order matrix. A checklist matrix shows whether a perspective is held by a particular group of participants, while a role order matrix shows the perspectives held by different groups and allows easy comparison.

The plus sign (+) shows the strength of each finding in relation to each group of participants. Symbols can make the reading of the table easier and give a more schematic

impression. Whenever a plus sign (+) is used, it means that part of this group of participants put forward a particular perspective, the number of signs show the extent to which participants from a group shared this perspective:

+ indicates for $\leq 20\%$ of the group put forward this perspective;

++ indicates for $> 20\%$ and $\leq 33\%$;

+++ indicates for $> 33\%$ and $\leq 50\%$;

++++ indicates for $> 50\%$ and $\leq 66\%$;

+++++ indicates for $> 66\%$ and $\leq 80\%$ and

++++++ indicates for $> 81\%$.

An important consideration is that indicating 20% of respondents put forward a particular perspective does not imply that 80% disagreed. So for example, saying that 20% of the teachers were not given a clear picture of the aim of the training does not mean that 80% of them said they were given a clear aim. Instead disagreement needs to be sought through other findings, which offer a contradictory perspective. In the case of the teacher-trainers, head-teachers and the EE and TSC programme designers, the extent of agreement was based on interview analysis. This raises difficulties in that qualitative data do not always lend themselves to exact quantification. However by checking the data interview and comparing what each respondent said in relation to a particular coding, one is able to present a best fit description. In the case of the teachers though, the extent of the response

is gauged by both questionnaires and interviews. This required rigorous cross-checking. If there is no sign in a box, it means that the particular group did not raise anything about this particular perspective, either because it was not within their specific area of knowledge and experience or because they were not asked about it.

In order to make the text more readable the signs have been described in every day language within the text as indicating whether a few, some, less than half, more than half, most, nearly all of a group of participants shared a perspective as below.

A few	For percentages $\leq 20\%$	+
Some	For percentages $>20\%$ and $\leq 33\%$	++
Less than half	For percentages $> 33\%$ and $\leq 50\%$	+++
More than half	For percentages $> 50\%$ and $\leq 66\%$	++++
Most	For percentages $> 66\%$ and $\leq 80\%$	+++++
Nearly all	For percentages $> 80\%$	++++++

Table 9.1: Explanation of expression of percentages in symbols

The perspectives of the groups of participants are described below (table 9.2). There are five categories: (i) the planning of the EE training, (ii) the planning of the sessions, (iii) the carrying out of the programme, (iv) the impact of the programme and (v) the evaluation of the programme.

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
The planning of the EE training	The planning and the organization of the training was not good (mixture of centralized-decentralized plus coexistence of training programmes)		+	+++++	+++++
	The lack of a legislative framework caused problems			+++	++
	The training should not be connected to political decisions or used for political purposes		+		++
	There should be only one training programme covering IT and ICT needs	+++		++	++++
The planning of the sessions	The selection of the teacher-trainers was 'good'			+++	+++++
	Lack of paper support documentation for the teacher-trainers				+++++
	The teacher-trainers were convinced about the educational importance of ICT			+++++	
	The training given to the teacher-trainers themselves was not satisfactory in respect to educational issues			+	
	The teacher-trainers did not possess sufficient subject knowledge	+++++			
	The teacher-trainers possessed sufficient IT and ICT skills	+++++			+++ (Good IT but not ICT pedagogy)

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
	The diversity of the teachers was not properly considered (range of ICT skills, school level and age)	+++		++	++
	Incentives were not given to teachers to take the course		++++	+++++	
	The teachers were not given a clear picture of the aim of the training	++		+++	
	The head-teachers appeared not to be aware of the training programme		++++	+++++	
	The teacher-trainers were facing problems while trying to get access to schools from the head-teachers			+++++	++
	The diversity of teachers was not being addressed	++			
	The diversity of teachers was being addressed			++	
The carrying out of the programme	The timetabling was not satisfactory	+		(They did their best to address it)	
	The pace was too fast	++		+++++	
	There was feedback on homework tasks	+++			
	There was not feedback on homework tasks	++			
	There was too much material to cover	+++			

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
	The training was not long enough	++++			++++
	There was little pressure for teachers to use ICT	++	+++	++++	
	There was little support for ICT integration on a school level		++	++++	++++
	There was little support to the teacher-trainers			++++	++++
	The head-teachers did not welcome the training			++++	
	Teachers and head-teachers had not discussed the training	++++			
	There no reward for teachers who took up the training	++	+		+
	Teachers were not doing ICT lessons with the teacher-trainers' help	+++		++++	
	Teachers were motivated to get the certificate of attendance	+++		++++	
	Collaboration among teachers was frequent during sessions	++	++++		
	Collaboration among teachers was not frequent during sessions	++			
	The training focused on theory as well as practice		+		
	There were too few examples of ICT use related to specific subjects	++++			
	The training focused on IT skills	+++			
	The training did not focus on IT skills	+++		++++	

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
	There were technical problems with the web-resources	+++++			
	The IT teachers occupied the suite in school nearly all the time	+++++		+++++	
	The IT teachers were not cooperative	+++++		+++++	
	The IT teachers were cooperative		+		
	There were few opportunities to observe lessons with the use of ICT	+++++		+	
	There were not limited opportunities for hands-on activities	+++++		+	
	The software program used was not sufficient or appropriate for subject teaching	+++		+++++	++
	The software program used was sufficient or appropriate for subject teaching	++			
	The e-yliko website was seen as useful	+		++++	+++++
	The training should be continued in some form	++	+++++	+++++	(the teacher-trainers did not promote it)
	ICT takes up lots of valuable time	(few thought it would be useless)	(and general CPD)	(and general CPD)	(and CPD in general)
		+++			

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
The impact of the programme	The use of ICT in classroom should not be compulsory (training, infrastructure and time should be given)	+++++	+	+++++	+
	ICT has most value for revision purposes	++++			
	Teaching with ICT motivates pupils	+++++			
	ICT has some impact on learning that cannot be achieved otherwise	++++			
	Teachers were persuaded of the importance of using ICT	+++			
	Teachers were not persuaded of the importance of using ICT	++			
	Teachers developed greater IT skills	++++			
	Teachers with no previous ICT knowledge were highly motivated and satisfied	(those with no previous experience) ++++			
	Teachers continued to value traditional teaching	+			
	Teachers did not see the value of conversational and cooperative teaching methods	+			+++++
	Pupils with good IT skills can help teachers use ICT in lesson	++++			++
	Pupils with good IT skills can make teachers feel uncomfortable				+++

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
	The training did not manage to alter teachers' pedagogy	+++++		+	+++++
	Teachers can be effective without ICT use	+++++			
	Teachers cannot be substituted by computers	+++++			
	Group work wastes time	+++++			
	There was too little formative evaluation during the training			+++++	++
	In order for ICT to be compulsory the necessary training, infrastructure and time should be given	++			
Evaluation of the programme	The demands of the curriculum hamper teachers from using ICT in subject teaching	+++++	++	+++++	
	Attending two computer related programmes was problematic	+++++			
	Motivation for many teachers to take part in the training programme was to acquire IT skills	+++++		+++++	
	The focus on teaching methods was not necessary	+++++			
	More knowledge about using ICT to support the curriculum was needed	+++++			
	Paper based material was needed to support teachers	++			
	Shorter but more frequent training sessions would help retention	++			
	Skills training should precede curriculum training	++		+++++	

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
	Pressure from the head-teacher would result in more teachers using ICT in lesson	++	+		
	An ICT advisor for each subject area would provide support			++	
	The consultant teacher could have supported teachers in using ICT		+		
	More technical support in schools was needed	+++++	++++	+++++	+++++
	Transferring pupils to the IT suite was disruptive for teachers	+++++			
	More time was needed for planning and preparation during and after the training	+++++		+	
	A second IT suite could address some of the problems of access	+++++		+++++	
	A classroom with 4-5 computers could address some of the access problems	++			
	If teachers had incorporated ICT in their teaching, this would have contributed to their confidence	+		+++++	
	Teachers were not doing ICT lessons with the teacher-trainers' help because of lack of time	+++		+++++	

Theme	Perspective	Teachers	Head-teachers	Teacher-trainers	Designers of EE and TSC programmes
	Those teachers who used ICT did so because of personal reasons	Those who use		++++	
	The general school culture did not allow innovation		+ (1 head-teacher being very explicit)	+++++	+++++
	The school culture is voluntarist		++		
	The training sessions should be more encouraging		+		
	Teachers' attitudes and beliefs did not favor the implementation of ICT in classroom		+	+	+++++
	Professional communities could be a support for teachers		+		
	Teachers did not use ICT because they could not see the value of conversational and cooperative teaching methods	++		+++++	++

Table 9.2: The perspectives of the groups of participants according to themes

9.3 Sharing of Perspectives

Table 9.2 shows that most of perspectives are shared within all groups. For example, the perspective 'The training should be continued in some form' was argued by some of the teachers, by most of the head-teachers and nearly all of the teacher-trainers and the designers of the EE and TSC. Many of the perspectives are shared by at least three groups of participants. For example 'There was little pressure for teachers to use ICT' was agreed by some of the teachers, more than half of the head-teachers and nearly all the teacher-trainers.

Some other perspectives are put forward by at least two groups of participants. For example, 'Pressure from the head-teacher could result in more teachers using ICT in lessons' was shared by some teachers and a few head-teachers. Finally some perspectives are put forward by only one group of participants. For example, 'The teacher-trainers did not possess sufficient subject knowledge' was only put forward by the teachers, in this case most of them.

Divergence in perspectives between groups is rare but there are some cases. The perspective that 'The training did not focus on IT skills' was shared by nearly all of the teacher-trainers and less than half of the teachers. What is more frequent is divergence in perspectives among the same group. For example the perspective 'There was not feedback on homework tasks' was argued by less than half of the teachers, while some argued that 'There was feedback on homework tasks'.

The fact that a perspective was put forward only by one group, or strongly by one group does not necessarily mean that other groups took a counter view. However in most cases divergence in the strength of perspective is understandable in that specific knowledge was available to one group and not available to another. For example, the designers of the EE and TSC could make more detailed comments on the design and the implementation of the training programme, since they had experiences of other programmes too, but they lacked information on the details of how this particular EE programme was carried out. The people involved in the design have an outsider's perspective on the training and offer an external check on some of the findings.

Sometimes it was the particular role each participant played, that led them give a different perspective on the same issue. Teachers and the teacher-trainers, for example, could comment on the training, but the teacher-trainers experienced the training from a different perspective. For example, the teacher-trainers and the people involved in the design strongly agreed that the planning and the organisation of the training was not good while only a few of the head-teachers mentioned this and none of the teachers. This is because the teacher-trainers had first hand experience of this area.

9.4 Key Findings

The key findings derived from the statements of all four groups of participants and shared by more than 50% of any group are summarised below. Of course, it is recognised that these findings do not describe the differentiated experiences within all the groups,

however, these are widely shared findings and a striking feature is the degree of overlap within and between groups.

I. The planning of the EE ICT training programme:

- The planning and the organisation of the training was not good (teacher-trainers; programme designers);
- The lack of a legislative framework caused problems (teacher-trainers).

II. The planning of the sessions:

- The selection of the teacher-trainers was 'good' (teacher-trainers; programme designers);
- Lack of paper support documentation for teacher-trainers (programme designers);
- The teacher-trainers were convinced about the educational importance of ICT (teacher-trainers);
- The teacher-trainers did not possess sufficient subject knowledge (teachers);
- The teacher-trainers possessed sufficient IT and ICT skills (teachers);
- Incentives were not given to teachers to take the course (head-teachers; teacher-trainers);
- The teachers were not given a clear picture of the aim of the training (teacher-trainers);
- The head-teachers appeared not to be aware of the training programme (head-teachers; teacher-trainers);

- The teacher-trainers faced problems from the head-teachers while trying to get access to schools (teacher-trainers);

III. The carrying out of the programme:

- The timetable was not satisfactory (teacher-trainers);
- The training was not long enough (teachers; programme designers);
- There was little pressure for teachers to use ICT (head-teachers; teacher-trainers);
- There was little support for ICT integration on school level (teacher-trainers; programme designers);
- There was little support to the teacher-trainers (teacher-trainers; programme designers);
- The head-teachers did not welcome the training (teacher-trainers);
- Teachers and head-teachers had not been previously informed of the training (teachers);
- Teachers did not carry out ICT lessons with the teacher-trainers' help (teachers-teacher; trainers);
- Teachers' only motive was to get the certificate of attendance (teacher-trainers);
- Collaboration among teachers was frequent during sessions, but not after that (teachers; head-teachers);
- There were too few examples of ICT use related to the specific subjects (teachers);
- The training focused on IT skills (teachers);
- There were technical problems with the web-resources (teachers);

- There were limited opportunities for access to the IT suite (teachers);
- The IT teachers occupied the IT school suite nearly all the time (teachers; teacher-trainers);
- There were few opportunities for teachers to observe lessons with the use of ICT (teachers);
- There were limited opportunities for hands-on activities (teachers);
- There were not many opportunities for practice in the school suite (teachers);
- The software used was not sufficient or appropriate for subject teaching (teachers; teacher-trainers);
- The e-ylico website was seen as useful, but the teacher-trainers did not promote it (teacher-trainers; programme designers);
- The training should be continued in some form (teachers; head-teachers; teacher-trainers; programme designers);
- ICT takes up lot of valuable time (teachers);
- Group working wastes time (teachers);

IV. The impact of the programme on school life:

- The use of ICT in classroom should not be compulsory (teachers; teacher-trainers);
- ICT has most value for revision purposes (teachers);
- Teaching with ICT motivates pupils (teachers);
- Teachers developed greater IT skills (teachers);

- Teachers with no previous ICT knowledge were highly motivated and satisfied (teachers);
- Teachers did not see the value of conversational and cooperative teaching methods (teacher-trainers);
- Pupils with good IT skills can help teachers to use ICT in classroom (teachers);
- Pupils with good IT skills could make teachers feel uncomfortable (teacher-trainers);
- The training did not manage to alter teachers' pedagogy (teachers; programme designers);
- Teachers can be effective without ICT use (teachers);
- Teachers cannot be substituted by computers (teachers);
- There was too little formative evaluation during the training (teacher-trainers);

V. Evaluation of the EE training programme:

- The demands of the curriculum hamper teachers from using ICT in subject teaching (teachers; teacher-trainers);
- Attending two computer related programmes was problematic (teachers);
- The motive for many teachers for taking part in the training programme was to acquire IT skills (teachers; teacher-trainers);
- The focus on teaching methods was not necessary (teachers);
- Skills training should precede curriculum training (teacher-trainers);

- More technical support in schools was needed (teachers; head-teachers; teacher-trainers; programme designers);
- Transferring pupils to the IT suite was disruptive for teachers (teachers);
- A second IT suite could address some of the problems of access (teachers; teacher-trainers);
- Teachers were not doing ICT lessons with the teacher-trainers' assistance because of lack of time (teachers; teacher-trainers);
- Those teachers who used ICT did so because of personal reasons (teachers who used ICT; teacher-trainers);
- The general school culture did not allow innovation (teacher-trainers; programme designers);
- Teachers' attitude and beliefs did not favour the implementation of ICT in classroom (programme designers);
- Teachers did not use ICT because they could not see the value of conversational and cooperative teaching methods (teacher-trainers);

9.5 Explaining Relationships through Concept Maps

So far particular perspectives have been drawn out but the relation between these perspectives has not been developed. To do this, I decided to make use of a concept map, which constitutes 'Concept maps are graphical tools for organizing and representing knowledge They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts indicated by a connecting line linking two concepts'

(Novak and Canas, 2006), with concepts being defined as ‘a perceived regularity in events or objects, or records of events or objects, designated by a label’ (Novak and Canas, 2006).

Concept maps are usually mentioned as a technique for enhancing learning, but if it is extracted from the teaching environment it can be seen as ‘an excellent way of helping to organise knowledge and so help understanding’ (Kinchin and Hay, 2000, p.1) The main advantages of this type of concept map is that it offers a schematic representation of concepts that are difficult to comprehend in a single page, and it is often easier to understand relationships that are presented diagrammatically. On the other hand, concept maps can be quite abstract and not include every possible perspective uncovered in the site investigated. However, if constructed with attention and thoroughness, concept maps present all the important factors, providing a clear picture of the event in question.

A method leading to a map representing the concepts arising from the research, as described by Trochim (1989), would be to highlight the perspectives collected, then sort them according to their similarity and rate them on a priority basis. In the case of my study, the main idea was to present data in a causal form, and not in a simple correlational form, which brings it close to what Miles and Huberman (1994, p.153) describe as ‘causal network’. The first step was to collect all the perspectives mentioned by all the groups, placing them in a matrix and from there to extract the most dominant ones. Following that, a lot of time was spent revising each perspective, examining each one of them separately and looking for causality relationships among the perspectives and all the data in general. This resulted in a system of interrelated perspectives, which was very complicated and

messy. For that reason I had to manage the quantity of the perspectives by grouping them in some more comprehensive themes. For example, the perspective 'Teaching with ICT motivates pupils' and the perspective 'ICT has some impact on learning that cannot be achieved otherwise', along with some other perspectives, were combined under the wider theme 'Teachers were able to distinguish the advantages and disadvantages of ICT use'. I next introduced a chronology putting together themes which I could relate to one of four main general phenomena, the map (see figure 9.1) shows these as:

- 'the programme was not planned appropriately';
- 'the sessions were not planned appropriately';
- 'the delivery of the sessions was problematic';
- 'there were differentiated but disappointing outcomes'.

These phenomena-concepts are shown as interrelated and leading chronological sequence to the 'disappointing' outcome. After identifying these four themes I had to re-consider and reconstruct the map. As a further check, I sought to cross-check the relationships I was identifying with the perspectives of each group in their evaluation of the training.

A combination of an 'inductive' and a 'deductive' approach was used (Miles and Huberman, 1994, p.155), starting by the examination of the specific, broadening to the general picture and then returning to the specific perspectives. The final map offers a web of interconnected factors leading to one or more of the main phenomena and frequently interconnected as represented by the double-headed arrows. The main phenomena-

concepts are presented in the middle of the map with colored ink, enclosed in boxes and lines show the relationships among them and the various perspectives factors; the arrows represent the phrase 'can lead to'. The CmapTools software was used in order to design the map and proved to be very useful.

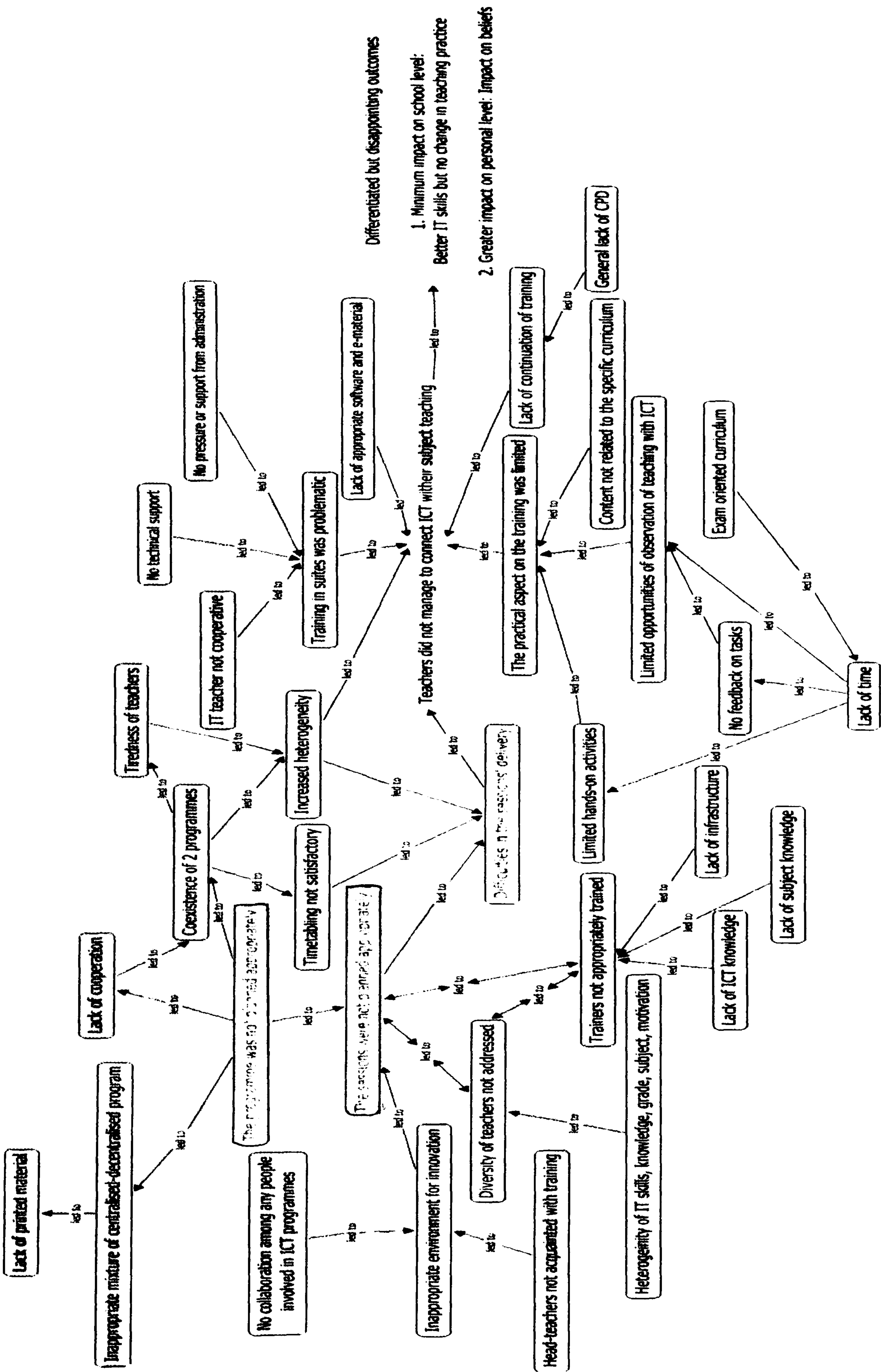


Figure 9.1: Mapping perspectives

9.6 Expanding the Map

The map shows the difficulties in the planning and implementation of the programme:

I. Concerning the planning of the EE training programme

The EE and TSC programme designers felt that the decentralised form of organisation of the training did not work, because the people involved were not used to working in that way. The teacher-trainers appreciated the decentralised nature of the programme's form and delivery but they wanted and needed more central support in provision of material and on going training. An additional factor was the co-existence of the two training programmes, which tired the teachers and increased their heterogeneity. Further, there seemed to be considerable problems with the timetable of the training, which demanded the participants spent their personal time after school lessons to attend that training. The majority of the teachers were not satisfied with the out of school hours. These defects in the planning of the programs led to problems in the planning of the sessions.

II. Concerning the planning of the sessions

As mentioned before, there were considerable problems in the planning of the sessions. The programme designers considered the training given to the teacher-trainers sufficient and that it covered the pedagogy and skills needs. However the teacher-trainers and the teachers felt that their training did not prepare them for addressing the use of ICT in subject teaching and that led to difficulties experienced in the training and meant that they

could not properly address the teachers' diverse subject background. Teachers differed as to their IT skills and knowledge and to the school level in which they were serving, the lessons they were teaching and their motivation for participating in the training programme. The teacher-trainers felt that they did their best to address the differentiated IT skills of the teachers, but this was not accepted by some of the teachers. The appropriate environment for the introduction of an innovation had not been created; there was no co-operation among the people involved in the ICT programmes and the head-teachers of the schools were not acquainted nor even informed about the participation of their teachers in the EE programme. All these issues caused further problems in the carrying out of the training.

III. Concerning the carrying out of the program

During the carrying out of the training there were further problems and the teachers did not manage to connect ICT with their teaching. Initially, the training in the suites was problematic. The IT teacher was not cooperative, there was no technical support and in general there was no pressure or support from school managers, to help carry out the programme. Nearly all the teachers said that they had not discussed the training with their head-teacher, although the head-teachers argued that they were at the teachers' disposal. However most of them agreed that IT teachers were unwilling to help or at least that the environment was not suitable for teachers to ask for assistance from the IT teacher.

The practical aspect of the training was limited since the content of the training was not related to the teachers' specific curriculum. There were too few opportunities for hands-on

activities and little observation of other teachers' teaching with ICT due to the limited time the teacher-trainers had at their disposition.

The fact that the training was ICT focused and the existence of the e-yliko website and the lack of good quality software, which could provide teachers with lesson plans, did not help teachers connect the training programme to their needs. Teachers felt they needed more time for practising and planning lessons, and follow on training and support. They were very aware of the exam oriented curriculum and the 'lack of fit' of ICT to those exams.

IV. Concerning the impact

The main finding from this research is that this was a training programme that had a minimum impact on participants' practice. The programme had a positive impact on a personal level, in the development of IT skills and belief in the potential of ICT, but it did not affect teaching practices.

9.7 Summarising Findings

In summary this chapter has provided a triangulated perspective on the programme. As an example, the issue of ICT competence and confidence was explored by tracking data sources and methods. First, the questionnaire data showed that most teachers worried about technical problems (Figure 5.15). Next the interview data showed that most teachers felt that the training programme could have been improved if they were provided with assistance preparing their lessons and in the classroom (section 5.5.3). As it was most

teachers were uncomfortable asking IT teachers for help. They considered that this was not the IT teacher's responsibility (see section 5.5.3).

IT competence was further taken up by teacher trainers, head teachers as well as programme designers, albeit there were some shifts in perspective amongst these different groups. For example, more than half of the head-teachers thought the lack of technical assistance as a factor that inhibited teachers from using ICT (section 6.5.3) and nearly all the designers argued that technical support was necessary for the successful implementation of ICT (section 8.5.3). By tracking this theme of IT competence through different sources of evidence the credible conclusion was reached that teachers lacked adequate IT skills, in part caused by lack of differentiated teaching and hands on practice within training sessions and in part enhanced as they lacked support in school. Other key findings are similarly supported through tracking of evidence.

Taking all the evidence of this chapter together a summary of the main findings follows.

I. Concerning the planning of the EE training programme

- the programme was centralized in its conception and planned in a top down manner
- teacher-trainers were given quite a lot of autonomy during the programme but they needed more central support in provision of material and on going training.
- planning did not address the co-existence of the two training programmes,
- planning the session for after school was not well received

II. Concerning the planning of the sessions

- teacher trainers did not have sufficient background IT skills or sufficient background to model the use of ICT in all subjects
- teachers were clearly differentiated in their IT skills, backgrounds and work situation and their different needs were not addressed
- there was a lack of co-operation among the stakeholders in particular between trainers, programme designers, head teachers and IT specialist teachers

III. Concerning the carrying out of the program

- the in school component of the training was not carried out due to lack of support and pressure in school
- there was too little hands – on work and too little relevant modeling of the use of ICT
- Teachers needed more time for practising and planning lessons
- teachers need further training and support.
- there was a lack of fit between the traditional exam oriented curriculum and the use of ICT.

IV. Concerning the impact

- the training programme that had little impact on teachers' practice. The programme had a positive impact on a personal level, in the development of IT skills and belief in the potential of ICT, but it did not affect teaching practices.

If this was a disappointing outcome was any factor more important than another? As discussed earlier the introduction of ICT in school is challenging, calling as it does for provision of infrastructure support and training, rethinking of pedagogy. The factors affecting the take up of ICT in schools are interrelated and each of the factors leading to the disappointing outcome in this thesis needed addressing.

9.8 Chapter Summary

This chapter brought together the perspectives of each group involved in the EE programme. Initially, they were presented in a matrix, being rated in terms of how strongly opinions were shared and by which group. An effort was made to investigate and reveal any potential causal relationships among these perspectives and to manage them and present them in a concept map. That procedure resulted in acquiring a clear picture of the data and the reasons why the programme did not have the expected impact on teachers' and schools' life.

CHAPTER 10: DISCUSSION

10.1 Introduction

This chapter compares the findings of this study with the literature on innovation, change and professional development as well as the research in the implementation or introduction of ICT into teaching and learning as described in Chapter 2. Through this comparison I will be able to locate my research in the 'field' by drawing attention agreement and disagreement with the literature and at the same time to validate my findings through external support and evidence. External validity and generalisability are definitions often interchangeable (Hammersley, 1993b) and refer to the possibility of generalizing the results of a specific study to other populations and contexts. Cuba and Lincoln (1994) refer to the concept of 'fittingness', instead of external validity or generalisability, the extent to which the situation under investigation fits other situations. Accordingly, findings are compared with other situations, different contexts and different populations, so they can be generalised.

10.2 Table comparing Findings and Literature

In order to make this comparison easier and more straightforward, I present five tables (see below) in which every key statement from the summary in Chapter 2 is presented and then cross-checked with the findings of the case-study.

What the literature says concerning the planning of a training programme	In this case	Particular features
Invest time and energy into planning (Huberman and Miles, 1984, McGilchrist et al., 1997, Hargreaves and Hopkins, 1994, Hind, 2000, Harris, 2002)	The planning of the training was not appropriate	Coexistence of two separate training programmes, the TSC and EE. Some participated in both programmes, which created confusion and tired some participants. It contributed to the differentiation of the participants within the programme and this was not considered in the planning. The training was planned to be decentralized but the implications here were not properly considered.
The designers of the programme need to understand teacher reactions and appreciate differentiated response and take into consideration their opinions and take into account teachers' eventual feelings and reactions (Evans, 1992, Gray and Wilcox, 1995, O' Donnell, 1996 Fullan, 2001)	There was no planning concerning the possible reactions of the people involved in the training	The teacher-trainers were not being prepared to consider all the possible situations they or head-teachers could face and how to best address the demands of the head-teachers and the teachers involved. The need for the cooperation head-teachers and IT teachers was not considered.
Teachers should be involved in decision making processes (Fullan, 1991, Hargreaves, 1992, Vivancos, 1997, Harris, 2002)	The training did not include teachers in decision making processes	Teachers did not know the real aims of the training, some took part aiming simply to develop their IT skills and knowledge. The head-teachers of the schools were not fully aware of this training programme.
The training should set clear purposes, aims and implications (Nias, 1989 Fullan, 1991, Gray and Wilcox, 1995, Hopkins et al., 1997, Harris and Hopkins, 2000, Harris, 2002).	There were interconnected aims but these were not clearly set out.	The main aim of the training was for teachers to use ICT in their teaching. At the same time, the programme was teaching IT skills and trying to change teachers' pedagogy towards a more collaborative method of teaching and learning. These aims were not clear to participants or teacher-trainers

What the literature says concerning the planning of a training programme	In this case	Particular features
<p>It is necessary to introduce a change and to use a training programme that fits the particular needs of the people to which it is addressed and the particular traits of the educational system within which it is to be embodied (Williams, 1991; Passey and Ridgway, 1992; Steadman et al., 1995; Craft, 1996; Hopkins, 2001; Harris, 2002, Goldstein and Ford, 2002)</p>	<p>The change and the training programme introduced did not fit the particular needs of the teachers or of the educational system</p>	<p>The programme did not take into account the specific school and teacher context or the centralised nature of Greek schools.</p>

Table 10.1: What the literature says concerning the planning of a training programme and the research findings

What the literature says for the planning of the sessions	In this case	Particular features
<p>No training can be effective, if it disregards that different people have different needs (McLean, 2000) and it is not tailored to participants' needs and expectations (Williams, 1991, Creemers, 1994, Steadman et al., 1995, Craft, 1996, Hopkins et al., 2001, Harris, 2002, Goldstein and Ford, 2002)</p>	<p>The training did not address teachers needs</p>	<p>Teachers entered the programme with different levels of IT skills, ICT and subject knowledge and this was not planned adequately.</p>
<p>Those planning training programmes should, before engaging the teachers in the training process, inform them about the potential and the benefits it could have for teachers and pupils as well, to be sure that the participants take a positive stance towards the tool they are to use in their daily practice (Nias, 1989; Fullan, 1991; Hargreaves, 1992; Guskey and Sparks, 1996, Baki, 2000; Harris, 2002; Guskey, 2002; Granger et al., 2002).</p>	<p>Teacher-trainers did talk to teachers before the start of the programme.</p>	<p>Teacher-trainers did not convey the pedagogical objectives of the training clearly</p>
<p>The training is carried out by persons who received pre-training with attention given not only to new subject matter knowledge but also to the didactics of in-service training (Beck, 1997) and are models of effective teaching (Cornu, 1997)</p>	<p>The teacher-trainers were not considered to be trained appropriately.</p>	<p>The teacher-trainers were not considered to have pedagogical knowledge of using ICT.</p>
<p>The teacher-trainers should be left free to arrange issues relevant to the structure and the content of the training programme and the process of its delivery in cooperation with the teachers or/and the head-teachers of schools, but at the same time they should have any support necessary to solve problems they meet, especially in centralized educational systems, by outside school agents (Joyce and Showers, 2002; Fullan, 1991, 2001; Stoll and Fink, 1996)</p>	<p>The teacher-trainers appreciated the decentralised form of the carrying out of the training but they lacked the necessary support</p>	<p>Teacher-trainers tried to plan a common curriculum in cooperation with the other teacher-trainers but they failed. They only met twice face-to-face but they had a mailing list for their communication. Teachers had some complaints about some management and organizational problems, for which teacher-trainers were seen as responsible for. These were issues that were not addressed centrally.</p>

What the literature says for the planning of the sessions	In this case	Particular features
An ICT training course of one year's duration, leading to the acquisition of a recognized certificate, and followed by school-based courses is the most popular among teachers (Charalambous, 2001).	The certificate given at the end of the year was a great motivation	Acquiring the certificate of successful attendance was the main reason for implementing lessons with ICT
Research evidence showed that the teachers are against the afternoon sessions, after school hours, especially those which last three hours (Charalambous, 2001)	The training length appeared to be adequate for the material to be taught but it was demanding.	The training took place outside school hours.

Table 10.2: What the literature says for the planning of the sessions and the research findings

What the literature says concerning the carrying out of a training programme	In this case	Particular features
Employ differentiated methods of teaching and flexible approaches (Kyriacou, 1991, Creemers, 1994; Hopkins, 2001, Muijs and Reynolds, 2001, Harris, 2002)	There was little employment of differentiated methods of teaching nor flexible approaches.	Differentiation by task and by learning style, as well as self-directed or on-line teaching methods was not frequent.
Combine theory and practice (Joyce and Showers, 2002, Joyce, 1992, Creemers, 1994, Harris and Hopkins, 2000, Harris, 2002)	There was a combination of theory and practice but not an appropriate mix.	The teachers needed more focus on IT and ICT skills, more hands-on activities, observation of lessons with ICT, so that they could see ICT use being modelled in situations they were familiar with.
The training needs to be in curriculum contexts and illustrate appropriate use (Dimou et al., 2002)	The training was in curriculum contexts but it did not address the specific curriculum needs of the teachers.	There were teachers teaching different subjects and as the programme was not differentiated, it could not address the curriculum contexts in which the teachers were working.
The training should illustrate the way of using computers as a tool for teaching (Williams et al., 2000, Kirschner and Wopereis, 2003, Charalambous and Karagiorgi, 2002, Potter and Mellar, 2002) and assessing (Kirschner and Wopereis, 2003) and their pedagogical use (McDougall and Squires, 1997, Kirschner and Wopereis, 2003). The training should allocate a significant proportion of time to hands-on activities and observation in order for the teachers to conceptualise what they have learnt in theory (Charalambous and Karagiorgi's, 2002; Harris, 2002)	The training did not manage to illustrate clearly the way of using computers as a tool for teaching and assessing nor their pedagogical use.	There was lack of illustration of how computers can be used for teaching and assessing and the teachers needed more examples of computer use in teaching. The lack of good quality software programme.
Training is carried out by teacher-trainers who are not perceived as 'expert technologists' but as fellow teachers (Strange et al., 1988, cited in Charalambous, 2001)	The teacher-trainers were ex-teachers but that was not an asset in the training.	The fact that some teachers knew the teacher-trainers as ex-colleagues made them suspicious of the quality of training they could offer and led the teacher-trainers to feel the environment was too informal.

Table 10.3: What the literature says concerning the carrying out of a training programme and the research findings

What the literature says for the implementation of ICT in teaching	In this case	Particular features
Build learning communities in schools (Barth, 1990, Hopkins et al., 1994, Stoll, 1999, Joyce et al., 1999, Senge, 1990, Wenger, 1998, Sergiovanni, 2000, Mitchell and Sackney, 2000, Fullan, 2001) related to collaboration (Nias, 1989, Darling-Hammond, 1990, Little, 1993, Hargreaves, 1992, Mortimore et al., 1994, Hopkins et al., 1996, Guskey, 2000, West et al., 2000, Harris, 2002), effective leadership (Sammons et al., 1997, Leithwood et al., 1999; Fullan, 2000, Jackson, 2000, Leithwood and Jantzi, 2000, Mitchell and Jackson, 2000, Sackney, 2000, West et al., 2000; Harris and Bennett, 2001; Hopkins, 2001; Day et al., 2002: 20; Harris, 2002)	There were no communities of learning or practice or effective leadership.	The training did not manage to promote teachers' cooperation in the implementation of ICT. There were moments of cooperation during the training but that was not extended in the school environment, which remained very individualistic.
Providing the participants with the necessary time to plan, learn, practice (Joyce and Showers, 2002, Stoll and Myers, 1998, Simpson et al., 1999, Dawes, 2001, Higgins and Moseley, 2001, Hopkins, 2001, Pelgrum, 2001, Wheeler, 2001, Caraban, 2002, Leithwood et al., 2002)	There was no extra time provided to the teachers	The teachers felt that they did not have appropriate time to plan and implement teaching with ICT.
The school culture should promote change (Barth, 1990, Hargreaves, 1992, Leithwood et al., 1995, Guskey and Sparks, 1996, Stoll and Fink, 1996, Walker et al., 1998, Hopkins, 2001, Mitchell and Sackney, 2000, Guskey, 2002).	The school culture did not promote changes	The culture in Greek schools is centralised and slow to change.
Giving the necessary support at technical and curriculum levels (Dorothy et al., 2000, Mitchell and Sackney, 2000, Preston et al., 2000, Cuban et al., 2001, Snoeyink and Ertmer, 2001, Harris, 2002, O'Machony, 2003, Tearle, 2003, BECTA, 2004, Nachmias, 2004)	There was no support outside the training sessions	The need for further support was put forward by nearly all the teachers and the head-teachers
The training should provide access to machines; based on the infrastructure and the supplies provided by the school's in-service training manager (Steadman et al., 1995) and in general there should be easy access to ICT both at school and at home (Strange et al., 1988, cited in Charalambous, 2001).	There was easy access for the training but not for implementation of ICT in teaching.	There was only one ICT suite in the schools, which was mostly occupied by the IT lesson. Teachers had no technical support and that resulted in lack of confidence in using the suite. Nearly all the teachers had computers at home but not all of them had internet access or time to practice ICT.

Table 10.4: What the literature says for the implementation of ICT in teaching and the research findings

What the literature says concerning evaluation	In this case	Particular features
<p>The literature points to the importance of evaluation (Dalin, 1998, Southworth and Conner, 1999, Harris, 2002, Goldstein and Ford, 2002) using observation (Cooper, 1989, Drummond et al., 1992, Hopkins, 1993, Eraut, 1994, Day, 1999, Southworth and Conner, 1999) and giving the necessary feedback (Rozenshine, 1983, Creemers, 1994, Eraut, 1994, McGilchrist et al., 1997, Joyce and Showers, 2002, Harris and Hopkins, 2000, Muijs and Reynolds, 2001) to develop a learning cycle.</p>	<p>There was no evaluation cycle either for teacher-trainers or teachers</p>	<p>Teacher-trainers were giving feedback to the Ministry about their sessions but they were not getting any feedback from the ministry to input into their sessions.</p>
<p>The training should provide participants with the necessary feedback on their performance (Tulder et al., 1988, Kerry, 1993)</p>	<p>Feedback on the teachers' performance was not given appropriately</p>	<p>Teachers felt that the teacher-trainers did not engage in an implementation of an evaluation cycle.</p>
<p>The training should be evaluated both in formative and summative way (Tulder and Veenman, 1991).</p>	<p>There was no evaluation made at the end of the training</p>	<p>There were questionnaires distributed to the teachers at the end of the training but they were never analysed.</p>

Table 10.5: What the literature says concerning evaluation and the research findings

From the table it is apparent that many of the aspects of the planning of the training, the planning of the sessions, the carrying of the training, the implementation of ICT in teaching and the evaluation of the training in this study were in contrast to what the literature suggests. In the cases where the planning of the training was in accordance with the literature, it seems that it was not implemented efficiently or that the context was not appropriate. These findings provide a mirror on how not to plan and implement an ICT in-service training.

To summarise, the people involved in this change did not take part in the decision-making and they were not well-informed in order for their cooperation to be secured. The form of the training was decentralised, offering the opportunity for teacher-trainers to adjust it to the needs of the teachers, but there was important lack of support at every stage. In addition, given that the Greek educational system is centralised, this type of training could not be easily carried out without the necessary central support. The teacher-trainers were given a long training covering IT and ICT skills, but this was not sufficient. They were ex-colleagues of the participant teachers, but this had a negative impact for some. They talked to the teachers before the training in order to inform them and persuade them of the benefits of ICT, which the literature presents as necessary step before the introduction of a change. Nevertheless, they did not communicate clearly the pedagogical objectives of the training. The attribution of a certificate, as suggested by the literature, did motivate the teachers. However, attendance in itself ended up being their aim and not implementation of ICT lessons during the training. The carrying out of the training itself was subject focused,

but since there were teachers from different grades, it was not possible for the teacher-trainers to cover all teachers' needs. In addition, there was not appropriate software to be demonstrated and eventually used by the teachers in their everyday work. The training also covered theoretical aspects of the educational use of ICT, besides the practical input, but this was not well-balanced. The teachers felt that they were not given enough opportunities to see in practice how to prepare and implement teaching with ICT.

10.3 The EE ICT Teacher Training Programme and the Greek Educational Policy

The outcomes of any training are not easily predictable, as they involve people, material resources, processes and systems. The EE training programme aimed at creating a stimulating environment for teachers, to enable them to embrace change, to integrate ICT into their professional practice. Yet the training failed to achieve its prime aims and had little impact on the work of the teachers and schools involved.

In the previous chapter an account was presented in which participants described their involvement in the programme and the explanations they gave of their behaviour. The analysis of the impact of the programme stayed as close as possible to the participants' accounts and was developed through my position as an observer of the programme. I had a privileged standpoint to collect and collate, compare and contrast the participants' perspectives and draw together an explanation of the phenomenon. This observer standpoint, and at the same time my access to the relevant literature and the documents

accompanying the training programme, allows me to go on to offer a more critical reflection of the case, a larger picture that suggests reasons why the participants explained their behaviour in the way they did. This wider picture leads to a discussion of the Greek political and educational system and how the main barriers to the use of ICT can be seen to have roots in a wider context.

In the study, for example, it was found that planning was not efficient. The consequences of the inappropriate planning were clear to describe, but the reasons for the inappropriate planning might not be so obvious to the participants, as they were not immediately involved in it or perhaps they took aspects of the planning for granted. To understand the weaknesses in the planning of the training programmes means moving beyond individual failings and taking into account the wider Greek political and educational framework in which planning took place. The barriers to proper or appropriate planning need to be seen in the context of a system that is traditional and not 'innovation friendly'.

10.4 Observations on Greek Educational Policy

A main trait of the Greek political system is discontinuity. In the previous century, there were frequent government shake-ups and attempts or periods of dictatorships (Kazamias, 1967). This was a serious obstacle in the reform of education. In fact, since 1980s, there have been attempts to democratise Greek education through decentralisation and democratic planning (Zambeta, 2002), but resistance to change continues to be very high.

Conservatism and modernisation clash within education policy, but centralistic and bureaucratic ways of governance remain (Zambeta, 2002).

Zambeta (2002, p. 638) identifies as main weaknesses in the modernisation of the Greek educational system the 'persistence of inequalities between urban and rural areas, social classes, and ethnic and religious minorities; the persistence of crammers for examination preparation; the persistence of traditional knowledge and formal pedagogy and the persistence of top-down governance'. Meanwhile, the Organisation for Economic Cooperation and Development (OECD, 1995) describes the failure of Greek education to introduce required reforms referring to inadequate resources, the centralisation and legalism of its administration, the nature of policy making and the lack of trust at many levels of the system (for further discussion see Persianis 1998).

The top-down character of Greek governance appears especially problematic in aspects of educational planning. In the centralised Greek educational system every important decision about the curriculum, the allocation of time to subject areas, books used in school, books for teachers, teaching materials, modes of student and teacher assessment is formulated and taken by the central government, through the Ministry of Education and its departments (Ifanti, 1995).

Planning barely takes account the opinion of the Secondary Education Teachers Federation (OLME). Although the State recognises the value and the political legitimacy of interest groups, it usually rules out involving these in decision-making. In 1982, for example, the Panhellenic Social Movement (PASOK), which took power in 1981, announced its

intention to cooperate with OLME, but this cooperation lasted only 3 years on good terms. Ever since, major changes have been introduced solely on the initiative of the Ministry of Education (Pigiaki, 1999).

Pigiaki (1999), discussing the discourse between OLME and the Ministry of Education, concludes that teachers' involvement in the national education policy-making has been problematic. OLME acts rather as a syndicate than as an educational community and seeks to promote teachers' economic interests and working conditions. OLME in turn accuses the Ministry of Education of making hasty decisions and not really wanting to engage in dialogue (Pigiaki, 1999).

In 1994, the Ministry of Education proposed a plan for the decentralisation of administration, which was turned down by OLME fearing change in the teachers' role. The Pedagogical Institute (PI), the main advisory body for the Ministry of Education, is likewise neglected, and 'educational changes tend to proceed without waiting for the Pedagogical Institute to come to any conclusions' (Kazamias, 1978, p. 40). This lack of dialogue among policy-makers, teachers and experts has led to a differentiated agenda and lack of a social consensus regarding educational policy and reform (Zambeta, 2002).

Educational planning has always been problematic, because it is often short-sighted. For example, in 1985, it was decided to have 5 curriculum routes at the last grade of Lyceum. The exam system was also altered to take into account internal assessment in students' final grade. This was considered a positive move, since it provided more choice and more motivation to participate in school. But it turned out that, because schools were not well-

prepared for the change, there were not even enough classrooms available to organise pupils into five curriculum routes. Eventually, laboratories and common rooms were used, with negative consequences for the functioning of the school. Teachers were not well-prepared for the changes, which led to the sudden repeal of the law in the middle of the academic year after a couple of years.

Policy changes in education have little follow-through. Frequently, a new government initiates educational reforms at the same time cancelling reforms previously introduced. The same might happen with the change of a particular Minister of Education. Persianis (1998) sees the discourse on educational reforms in Greece, as 'political' rather than 'scientific'. There is a wider view in Greece that each Minister of Education introduces a new educational system simply in order to see his/her name associated with it (Tiberius, 2000). During the period 1974-2004 twenty different Ministers took turns leading the Greek Ministry of Education.

The centralised, inflexible and bureaucratic character of the Greek educational system is regarded as the main reason for its chronic crisis. Attempted reforms met the strong resistance of OLME, of other educational factors and of the opposition political parties (Katsikas and Therianos, 2004).

The socialist Minister of Education during the period 1994-1996 George Papandreou drew upon relevant academic advice for the 'Ethniko Apolyterio', or National Studies Certificate, and announced a new reform in June 1996. This innovation met strong opposition of OLME, which regarded the 'Ethniko Apolyterio' as reproducing existing

problems and enlarging social inequalities (Informative Bulletin of OLME, Athens, 1996). In October 1996 his successor Gerasimos Arsenis withdrew this proposal on the ground that there had not been satisfactory preparation for its application. At the same time he introduced new wide scale educational reform, which offered a more autocratic model for education (Grollios and Kaskaris, 2003). He published a report titled "Education 2000: Towards a Paedia of Opened Horizons" in order to justify the proposed reforms. The main claim of this report was that in the information society we live in and during the epoch of a 'learning society' it is essential to have a relevant curriculum. However the reforms again met the opposition of teachers and the pupils as well, which was manifested in demonstrations and in long lasting occupation of school units by pupils during the two following years 1998-2000.

The hasty and superficial nature of the innovations introduced into the Greek education is evident from the fact that sometimes change follows change in a short time, although it is known that there needs to be time set aside for a school to embed the change and that schools that are constantly changing will have little time for consolidating change (Fullan, 2001). Another example concerned the reform of 1997-1998. Among other aspects of the Greek educational system this proposed the replacement of all textbooks used in schools at all levels. This led to the production of an enormous quantity of new books, which created serious problems for teachers as they were not trained to use them. Shortly after, a new political leadership at the Ministry of Education, realising a proposal of the Pedagogical Institute and its new President, decided to replace the new textbooks used in primary and

in low level secondary schools without having previously evaluated their value or effectiveness. This 'change of change' was strongly criticised through the press (Karaiskaki, 2003; Chatzigeorgiou, 2003).

The lack of continuity and coherence in the Greek educational system becomes evident in respect to teacher in-service training. In June of 1991, the YPEPTH set up a Committee of Experts to investigate teacher training and submit their suggestions for improvement. These suggestions led to Law 2009/1992 about teacher in-service training and to the signing of the Presidential Decree 250/1992 that set up the Regional Training Centres, known as P.E.K., to be responsible for teachers' in-service training. Three years later, in January 1995, the Presidential Decree was suspended and by the Ministerial Decrees Γ2/2322/29-3-95 and Γ2/7578/12-10-95 a '*flexible training programme*' was introduced. Two new Committees undertook the responsibility to investigate the impact of P.E.K's three years' function in the prospect of planning a framework of teacher training for years 1996-1999. It is worth noting that a member of P.I. who tried to explain the philosophy of the new in-service programme to the teachers anticipated their objections, recognizing that the programme will stay in 'words' as 'we have seen this performance many times' (Matthaeou, 1999).

There is no tradition of the assessment of needs in educational planning. Programmes are implemented which do not meet explicit needs and lack a clear rationale. The Centre of Planning and Economic Research (KEPE) (2003) questions the aim of recent changes in the educational system and suggests that there has been a tendency towards the provision

of more education without considering the needs of the society and the economy. Similarly, the Labour Institute of the General Labour Confederation of Greece (INE-GSEE 2001) suggests that there is no analysis of the vocational needs of students and their vocational preparation. It has been suggested that Greek education systematically ignores the needs of the labour market and produces unemployed graduates and not people that hold qualifications relevant to the needs of the labour market (European Commission 2003, see also OECD 1997).

A chronic problem of the Greek educational system is the low public expenditure on education. According to the annual report of the Organisation of United Nations about 'Human Development' Greece is classified in 105th position regarding spending among 132 countries. It is said to spend about 3-3.5% of the total Gross National Product (GNP), while the average of the countries in the European Union approaches 6%. It must be noted that the ICT teacher training programmes in Greece were funded by the Second and Third Community Support Framework and this means that their continuation depends on E.E's funding. (Kynigos, 2003; Vavouraki, 2004). This is closely connected to another significant problem of the Greek educational system that explains some of the research findings. In 1986 the obligatory nine-year education for all children was institutionalised. But official data of YPEPTH reveal that a rate of 6-7% of the total number of Greek pupils do not complete their education, a fact tolerated by the Government (Katsikas and Therianos, 2004).

Summing up, while the experience of schooling is mixed and the system does provide free education even at higher education level, the failings of educational policy in Greece might be seen in terms of discontinuity and instability, centralisation, autocracy and bureaucracy, inconsistency and incoherence. There is no tradition of seeking consensus among policy makers, teachers and experts and lack of follow through in decision making. All these traits can be said to be reflected in the present study as regards the planning and the execution of EE ICT in-service teacher training.

10.4.1 The Specific Case of ICT in-service Training Programme

The fact that educational planning in Greece is often unsuccessful does not necessarily mean that the planning of the EE ICT training programme would necessarily be defective as well. However, seeing the wider picture explains in some way why procedures, which might be taken for granted in more democratic and responsive systems, were not followed. It further explains why some well meant initiatives were ineffective. For example, there was an attempt at creating a more decentralised approach in some aspects of the programme, but this added to the difficulties. One reason was of course that the programme as a whole was 'top down', but it may well be that as there was no tradition of working in a more mutually supportive and bottom-up way participants did not take up the opportunities they had. The deficits of the Greek educational policy referred to above seem to have influenced the planning and the execution of the programmes for the implementation of ICT in Greek schools.

The introduction of ICT into the Greek educational system followed the traditional top-down innovation policy in which experts plan and propose an innovation and expect teachers to implement it, at least in its most basic aims and features, while the school remains in the margin as regards the decision making (Samatas, 1995; OECD, 1997; 2000; Vavouraki, 2004). This means that EE ICT teacher training was put forward without the participation of teachers, who were instrumental in implementing the change, in its planning and in decision making and without their commitment to the change itself, which is regarded as a key factor for effective change and school improvement (Harris, 2002; Fullan, 1991; Hargreaves, 1994). Many researchers have pointed out that such centralised top-down systems do not allow local-level action (Shaeffer, 1991) and are more likely to fail (Fullan, 1999).

This strategy, as appears from the policy makers' comments, was ineffective. In the Greek case, the innovations and reforms introduced in the educational system are not connected with parallel attempts of administrative modernisation (autonomy of school unit in matters of planning, finding, securing and managing of funds), but in contrast are imposed by a central administrative authority and are based on existing structures of a ineffective system (Salteris, 2004).

The centralised character of the Greek educational system and the top-down delivery of the EE ICT training program means that it did not take into account the specific needs of teachers to whom it was intended. Literature clearly shows that no educational change can be successful, if it does not meet the particular developmental needs of teachers and

schools (Hopkins *et al.*, 2000; Hopkins, 2001), that all highly effective programmes matched the developmental needs of the school with the particular strategy employed (Harris, 2002). Literature also shows that there is no 'one size fits all approach' and that those who employ this kind of approach misunderstand the process of school and classroom-level change (Stoll and Myers, 1998; Hopkins *et al.*, 2000).

Furthermore, the EE ICT training programme tended to concentrate on teacher level change only, although recent work has recognised that most effective school improvement programmes encourage a multi-level approach and necessitate using all implicated factors at all levels (school, teacher and classroom), both internally and externally (Harris, 2002).

A most important deficit in the programme studied was the coexistence of two separate training programmes, the TSC and EE. Some teachers participated in both programmes, a fact that created confusion, tired some participants and made them leave the programme, and contributed to the differentiated needs of the participants. The lack of cooperation and interaction between the providers of these programmes and the overlap of their content made some providers suggest that the TSC should precede the EE training programme.

In fact, the Ministry of Education gave a great deal of publicity to the TSC programme, which was a large-scale programme, but this may have been short-sighted. The programme involved 75,000 teachers, and offered them money for buying a computer. This scheme was widely advertised, and needs to be seen in the context of the pre-election campaign. However it was an ill thought out initiative since the follow up to TSC was not implemented, because of lack of teacher-trainers and eventually of financial resources.

Without these follow up programmes, TSC could not enhance the implementation of ICT in subject teaching. The new certificate for IT skills, which would come after the TSC, was not introduced, for similar reasons. Moreover, the amount of money given to teachers during the TSC programme to buy a computer was seen as disproportionate and leading to little change in classroom. A well considered policy with the cooperation of all parties: academics, teachers, politicians and financial managers would have led to better results.

The problems identified in Greek educational policy affect ICT policy as well. This point is clearly emphasised by Kynigos (2003) who, referring to the 'Odysseia' project, shows that:

Some of the difficulties met in implementing the project were administrative/managerial ones such as the considerable workload involved in coordinating the parallel integrated and interdependent implementation of a variety of projects.

(p. 264)

Research shows that in countries where education is centrally administered it is Ministry of Education's duty to create a coherent ICT policy, which should coordinate all relevant activities throughout the system at national and local level (Charalambous, 2001). This means that the EE ICT training programme should be incorporated in the whole teacher in-service training framework and in all professional development opportunities and should have a long-term goal. However the EE ICT in-service training stopped suddenly and unexpectedly for unknown reasons in the academic year 2003-2004 and the teacher-

trainers were forced to go back to their previous positions. This was seen as a result of political interference as there had been no detailed evaluation of the programme.

This theme of political interference was taken up by programme designers who realised that, while there were many experienced IT teachers, there were not enough who had the necessary skills to carry out effective ICT in-service training programmes. In fact research at the University of Thessaloniki (Barbas *et al.*, 2002) showed that the Committee responsible for the selection of trainers downgraded the criteria during the second year (2001-2002) resulting in the engagement even of those who had little previous experience with ICT and education. It would have been more appropriate if the Committee had been free to offer more incentives to teachers in order to recruit the most appropriate ones as teacher-trainers. In the study, the teacher-trainers commended that their job as teacher was better than that of teacher-trainer, taking into account the salary and the stress. They added that this was one of the reasons why some teacher-trainers gave up their posts.

The lack of sufficient funding explains on the one side discontinuation of the EE ICT in-service teacher training and the lack of appropriate infrastructure, the lack of updated computers, the lack of support by expert people on the other. The Ministry put forward a training programme without having secured the basis for its successful implementation. In addition, as we noted earlier, there was political interference and an insufficient system of pre-service and in-service training.

In short, the EE programme's planning and its execution showed almost all the negative traits of the Greek educational policy: it was hasty, off-handed and incoherent; it was not

based on the consensus of the implicated factors and did not take into account teachers specific needs; it was short-sighted and lacked follow through and continuation. So, it was doomed to fail.

10.5 Greek Schools and Teacher Culture

The educational context at school and at teacher level can explain some aspects of teachers' stance towards the EE ICT in-service training they received.

Until 1997 the recruitment of teachers depended on a waiting list called 'epeterida'. According to this policy appointments to schools were made according to the date of submitting an application for registration on it. This means that the sole criterion for teachers' appointment was the possession of a university degree without requirement of any other professional qualification. In 1997, the Minister of Education Gerasimos Arsenis through the Act 2525/1997 addressed this situation and set up national examinations for the appointing of teachers to state schools. But this measure, which is an example of 'mechanistic egalitarianism' (Persianis, 1998), led to a conflict between the socialist Minister and the Teachers Union (OLME), which culminated to his replacement (Pigiaki, 1999). There was some limited reform, but this still meant that prospective teachers did not carry out a programme of mentoring and training. As Barmazis (2001, p.87) says:

An unprepared teacher, scientifically and pedagogically, goes to school without having studied it, teaches without having studied the teaching, assesses without having studied the assessment and without being evaluated himself, he shapes pupils' personality without having studied the way personality is shaped.

The salary and work conditions of Greek teachers is an important consideration here. Salaries in Greece are lower than those in most OECD countries, but their ratio to the average earnings is higher in Greece than in most OECD countries (Tsakloglou and Cholezas, 2005). Perhaps because of this, teachers' population is dominated by females. In year 1999-2000, according to the information given by the National Statistic Service of Greece, out of 20,390 low-level secondary school teachers 9,896 (49%) were female. More specifically, from 7,245 philologists working in Greek high-level secondary schools 5,128 (71%) were female and out of 10,234 philologists working in Greek low-level secondary schools 8,498 (83%) were female. Many of these female teachers have key roles in the functioning of their home (and increased family responsibilities) in a society that has been until recently a traditionally gendered society. The teaching profession has great appeal to women because of 'relatively good salaries, the nature of the work itself, and the ability to better combine family and employment responsibilities than is found in other occupations easily open to women' (Wylie, 2000).

This explains why even if teaching hours are not tremendously long, teachers are short of time. The newly appointed teachers are obliged to teach 21 hours a week, which are reduced to 18 for teachers with 12 years of service. The philologists, who took part in the present research, have to teach a wide range of subjects, such as Modern and Ancient Greek Language and Literature, History of all ages, Latin and Psychology to complete their timetable.

The fact that there is little tradition of in-service training, little time set aside for training and no organised feedback on teaching makes professional development difficult for Greek teachers. Teachers' duties and responsibilities are defined by the Ministerial Decree Φ. 353.1/324/105657/Δ1 (FEK 1340B/16-10-2002). Among other points it is said that:

Teachers stay at school during school working hours beyond their teaching to offer other services related to the general educational task, according to the existing regulations. The services offered by each teacher are defined by head-teachers' order.

(& 36.17)

It is also said that teachers 'use the teaching aids and the new technologies. For this purpose they must ask in cooperation with the head-teacher ways of familiarisation with their use' (& 36.26). The same Decree defines that 'teachers accept the School Advisors in their classrooms and cooperate with them' (& 36.6). Little of this happens, because the Teachers' Union (OLME, 1995, No 645) has declared that School Advisors have only a guidance role and not an evaluative one and that teachers on in-service training should not be subjected to any form of assessment.

Relevant to that is the issue of teachers' evaluation and the absence of pressure. When the Panhellenic Socialist Party (PA.SO.K.) won in the elections in 1981, it abolished the school Inspectors and replaced them with the School Advisors (Act 1340/1982). One of their responsibilities is the evaluation of teachers. But after more than 20 years the legal statute for the system of teachers' assessment has not been realised. In 1998 the Ministerial Decree Δ2/1938/26-2-98 and the Circular of the YPEPTH Γ2/4791/7-9-98 completed the institutional framework of assessment of the educational work and of teachers, but these

legal provisions remained inoperative under pressure from the educational community. After that, the Government voted the Act 2986/2002, which is not yet operative. The Teachers Union (OLME) rejects any form of individual evaluation of teachers and their performance. Furthermore, they demand that no head-teacher or school advisor should play any part in teachers' evaluation and that the teacher is the sole judge of her/himself (OLME, 1995, No 645).

In the case of Greece there is little institutional pressure on teachers. Those who should exercise some pressure on teachers to innovate, the Ministry of Education, the Heads of the Prefectures of Education, the School Advisors and the Head-teachers of schools do not do so. The Ministry of Education has little direct interaction with schools, while the other bodies are not institutionally entitled or authorised to exercise any pressure on teachers. The lack of any system of assessing teachers' performance in action since 1982 increases their indifference for promoting the innovations that are introduced in education.

Teachers in Greece work for the public sector, they are centrally employed for life, they are too often seen as 'functionaries', who implement ministerial decisions. Teachers in the State system have a permanent contract of employment. In 2002 the Greek Parliament voted Act 2986 about the organisation of the regional services of Primary and Secondary education, the assessment of the educational work and the teachers as well and their in-service training. This Act brought the Regional Training Centres, known as P.E.K., under the newly established Regional Educational Prefecture (Law 2817/2000) and the training of teachers under a newly established Teachers' Training Organisation, known as

O.EP.EK., which is supervised by the Ministry of Education. But this institution has not yet been set into operation. Under these conditions, the teachers in the study had a 'take it or leave it' approach to the programme and lacked experience of working in a tradition of collegiality and feedback.

Additional problems are caused by the curriculum, which restricts movements towards any innovation. According to the common practice of the Greek centralised educational system the Ministry of Education and its advisory bodies plan a curriculum for both primary and secondary schools and impose on the teachers the responsibility to cover it without giving them the right of any deviation. So, as Kynigos (2003, p. 246) maintains, the teacher is viewed as 'technical mediator of a centrally pre-defined informational sequence (curriculum)'.

The Greek educational system remains examination oriented. In such a context the '*good teacher*' is regarded the teacher who manages to help her/his pupils to enter the University. So, schools, especially Lyceums, are transformed into 'examining centres' and schools of 'measurable effectiveness', and teachers' interest focuses on covering the specific examination material without attending to the quality of education given to pupils. This is backed by the parents of pupils also who are almost exclusively interested in their children acquiring a degree which will help them to find a job in the future (Katsikas and Therianos, 2004). This again explains why the curriculum was raised as a major issue in this study.

Pigiaki (1999, p.62) talks about an 'almost pathological condition', where there is no assessment of teachers' needs and training, where there is no self-reflection or self-

development, where there has been no evaluation of teachers' work for the past 20 years. Reflection of this 'pathogeneia' is the so called 'parapaideia', that is 'parallel education' or private classes, which almost every pupil attends after school time in their attempt to increase the probability of entering University. This diminishes pupils' interest for school, increases their boredom and indifference for what is going on in schools and makes teachers less committed (Pigiaki, 1987).

Teachers are accused of failing and for 'demoralisation of schooling and for the school's failure to attract students' (Zambeta, 2002, p. 645). However, reformers consider solutions to this problem, for example the introduction of new evaluation methods for students and pupils as well, without any substantial reform of the curriculum and the teaching methods (Zambeta, 2002).

10.5.1 The EE ICT Teacher In-service Training

In this study, teachers explained their behaviour in terms of the barriers they were facing towards ICT use. Their main concerns were lack of time, difficulties in access, curriculum pressure and technical support. But the barriers mentioned by the participants can be re-interpreted. They need to be seen in the context of a system, which is inherently traditional and not innovation friendly.

The teachers often mentioned lack of time as the main barrier towards ICT use. They had no time to practise ICT, no time to perform teaching with the teacher-trainer's help, no time to plan teaching with ICT and no time to cooperate with other teachers. But use of time

needs to be seen in terms both of personal choices and institutional context. For example, female teachers have a lot of family responsibilities, while many teachers, male or female, are forced to channel their activity into 'Parapaideia' in order to increase their salary. Teachers interpret time after school as 'their' time and after school Inset is seen as an extra and not an opportunity, a position strengthened as discussed earlier by the position of the teachers union.

The lack of support, which is regarded as a serious barrier to the use of ICT in classroom (Bradley and Russell, 1997; Cuban, 1999; Preston *et al.*, 2000; Snoeyink and Ertmer, 2001; Butler and Sellbom, 2002) adds further demands on time. Teachers wanting to use ICT in their subject lessons need to receive technical support and assistance from school advisors, head-teachers or IT teachers. However these same people might lack the appropriate ICT knowledge and skills or are not authorised to assist. Head-teachers complained that they themselves needed some assistance in the evaluation of the quality of the available software.

In this study, one head-teacher stated that he did not want to interfere in the work of the teachers of his school and that he did not know what was happening in classrooms. Although the Ministerial Decree that defines head-teachers' responsibilities (FEK 1340 B/16-10-2002, Chapter D) gives them the right to undertake initiatives of educational and pedagogical character, they do not exploit this right in order to not conflict with their teachers' and the Teacher Union's (OLME) resistance. There is no tradition of exercising

the leadership required for innovation in Greek education and, in this, study the success of the programme.

IT teachers are not obliged to help the teachers to solve the problems they face nor they can be present continuously at school for this purpose. Furthermore, most of them do not have the necessary time for the reasons referred to above. It is clear that under the present conditions the necessary support in its widest possible sense, as described by Kynigos (2003), cannot be offered.

The issue of support is closely related to the pressure, which is regarded as a necessary preposition for any successful innovation. Most research seems to agree that a balance of pressure and support is needed for improving school culture and a factor that promotes educational innovations and reforms (Hargreaves, 1994; Stoll and Fink, 1996; Harris, 2000; Fullan, 2001; Harris, 2002).

Concerning the curriculum, some of the teachers found that ICT was incompatible with the demands of school curriculum. One teacher commented in the study that pupils themselves reacted to the use of ICT by asking for a return to a traditional way of teaching. Pupils have internalised the strategic demands of a system, which focuses on final examinations of prescribed material. Most of the teachers could not connect ICT use with the preparation of that examination, or were forced to limit the use of ICT in lessons to revising text book material. Many of the head-teachers too appealed for a more flexible and relaxed curriculum and timetable and a reform of the examination system, and said that under the present conditions teachers could not use ICT.

In fact, the material that must be taught is so huge it forces teachers to follow the prescribed curriculum. Things get worse in the case of the Lyceums' teachers. They feel strongly pressed by the national curriculum and focus on preparing their pupils to participate successfully to the examinations which are closely connected to that curriculum and which lead to University. This reinforces the findings of other researchers who note that curriculum and public examinations have an impact on the use of ICT (Harrison *et al.*, 2002; Somekh *et al.*, 2002).

Into such a context Greek teachers cannot undertake initiatives and support the reforms that are introduced in school. In fact, no real demand has ever been made by Teachers' Union (OLME) for professional freedom and initiative, and, as Pigiaki (1999, p. 62) says 'it is this state of affairs that turns Greek teachers into crippled professionals who, at the same time, are not in a position to engage in any genuine pedagogy'. There is an actual paradox hidden in the culture of Greek teachers. They are quite strong and protective of their rights, being able to stop innovation, but at the same time they are not strong professionally as they cannot proactively set an agenda for the reform and professionalisation of teaching.

Access to computers and general infrastructure need to be seen as part of the general under-funded educational system: 'the lack of funding by the government does not allow neither teacher training nor the securing of the necessary equipments' (Oikonomou, 2004).

The above analysis of Greek political culture and educational policy helps to put the failure of teachers to use ICT in their classrooms into context. Of course it could have been

otherwise. The structure contributed to a negative climate, but it did not determine the outcome. At least two of the teachers who took part in the EE ICT training courses managed to apply the knowledge they acquired. The training did give the necessary basis for teachers to use ICT in the teaching and that the barriers mentioned by teachers could be overcome. Those teachers were not very different from the others; they had significant teaching experience and no previous ICT experience. In their cases, any deficiency of the training or technical shortcoming were not obstacles in their aspiration to use ICT.

Despite all the constraints mentioned earlier it needs emphasizing that teachers voluntarily decided to participate in this training, which was outside school timetable and which would not offer them any prospective for a better salary or job. It seems that the teachers were willing to acquire knowledge and to participate in a training course, because they wanted to feel more professional. Although the training was not addressing teachers' particular needs, they attended the whole training. The certificate of attendance they were given was a great motivation for them. However there were teachers who completed the training only for this reason. Under these conditions, the training was not considered useful for improvement of the teaching and learning process, but for professional development in an abstract way.

10.6 Teachers at the Heart of Change

The notion of time is a very subjective one (Fullan and Miles, 1992; Hargreaves, 1990; Campone, 1995; Collinson and Cook, 2001). When teachers admit that they do not have

enough time, they are not particularly talking about scheduled time. 'Time is something that is constructed to a large extent by the individuals who live that time' and it can be constructed 'rationally, phenomenologically, and cyclically' (Campone, 1994). Rational-technical time is different to the one that is lived and different to the one that is created for societal needs such as academic year. According to Collinson and Cook (2001) a rethinking of time should be made, allowing time for reflecting, thinking and cooperation among teachers.

Likewise, the constraints of access to suites and the technical support could be overcome through the adoption of a different concept of the educational setting. Lack of access to resources can seriously limit what teachers can do in the classroom with regard to the implementation of ICT (Mumtaz, 2000). There were teachers who could overcome the problem of the existence of only one computer suite by gaining access to the ICT suite. Research has shown that even in those countries where schools' computer: pupil ratios were comparatively low (10:1) many teachers (40%) complained of lack of computers (Pelgrum, 1999). This means that in some cases the organisation of resources counts more than their physical lack of them (Pelgrum, 2001). In fact, teachers and their school head-teachers can optimise the use of the available equipment.

Teachers are at the heart of any successful school change and a dialogue with them is indispensable for any relevant planning (Harris, 2000). Their vision has an important impact on professional growth and development and makes teachers' profession meaningful (Fullan, 1993). Teachers who are committed to their pupils' learning and their

own professional development are often keen on the implementation of ICT in their teaching (Moseley *et al.*, 1999; Becker and Riel, 2000). Teachers' beliefs and attitudes towards the educational use of ICT is a highly rated factor leading to implementation of ICT in subject teaching (Robertson *et al.* 1996; Davis *et al.*, 1997; Bonnett *et al.*, 1999; Rudd, 2000).

The theme of motivation and commitment arises once again. Research evidence shows that 'educational change depends on what teachers do and think' (Fullan, 1991, p.21), on their beliefs and values (Nias, 1989), and that an innovation may fail if implemented in a context and in a culture that is not congruent with its principles and aims (Guskey and Sparks, 1996); that to commence an improvement process someone has to diagnose, first, the particular culture of the particular persons or schools to which it is addressed and then to try to change this culture for the better (Guskey, 2002). It seems that many of the teachers who attended the EE ICT training programme had ideas that did not help the trainers or that they were not committed to or had not understood the aims of the training programme. It is known that, if teachers are not convinced of a proposed change, the success of the innovation is uncertain (Baki, 2000).

Many researchers say that 'teachers need to be committed to the change as they will be instrumental in implementing it' (Harris, 2002, p. 19) and that commitment to staff development is one of the conditions that contribute to creating a climate where change and innovation can be implemented (Hopkins *et al.*, 2000; Granger *et al.*, 2002). In general, many researchers show that negative beliefs and attitudes cause resistance to

change (Veen, 1993; Albaugh, 1997; Mumtaz, 2000; Snoeyink and Ertmer, 2001) and with little perception of benefits (Cox *et al.*, 1999; Snoeyink and Ertmer, 2001; Yuen and Ma, 2002) teachers will refuse to use ICT in classrooms. This resistance can be seen in terms of teachers' unwillingness to change their traditional teaching practices or in terms of schools as institutions that find it difficult to reorganise in ways that facilitate reform practices enabling the use of ICT (Albaugh, 1997; Cuban *et al.*, 2001).

Motivation for reform and change is closely related to the clarity and concreteness of the proposed change. Teachers did not have a clear conception of the purpose of this programme and some of them participated expecting and intending to learn some basic ICT skills. But this was not the main object. The participants would naturally be disappointed with the training, if this was their expectation. Literature refers that setting clear and transparent aims and building goal consensus as an activity that can increase teachers' motivation (Leithwood *et al.*, 2002; Hopkins *et al.*, 1994) and contribute to the implementation of any change (Fullan, 2001).

It is an inescapable conclusion that a reform of the educational system should be introduced in Greece in order for ICT to be used in schools. If we imagine that these same teachers were working in schools where innovation was valued and change was embraced, then a different outcome would have been possible. If the system were different, then people would act accordingly. But this transformation takes long time. Meanwhile programmes like this will encounter predictable obstacles. Hatzilakos (2003) talks about subjective difficulties connected to motivation, pension, examinations, Ministry's

guidelines, the nature of knowledge and the role of teacher, the aims of education, the accept of personal responsibility. He adds that if teachers have to change their beliefs because they are the obstacles to the Information Society.

The teachers themselves should realise the importance of their role and the responsibilities they have towards their pupils. They should consider themselves professionals and should seek their own continuous development and keep up with the demands of the Information Society. However, ICT in schools, or indeed any other innovation, cannot succeed by means of a voluntary training programme, only by deeper educational reform.

Teacher-trainers could have done more in this case study. They could have tried harder to differentiate their methods, according to the needs of the teachers, and been more focused on the use of ICT in classrooms. However the selection of the teacher-trainers was part of the problem of the programme planning.

Head-teachers could be part of the change as well. They could try to support their teachers in their professional development and they could facilitate adoption of innovative methods. They could investigate new approaches to professional development for their teachers and encourage participation. They could also organise training days on themes of interest to the teachers and the schools. However, they too are constrained by the educational system, which is ambiguous concerning their responsibilities.

IT teachers could offer their knowledge of IT to teachers and make better use of IT suites. They could provide help on technical issues and facilitate teachers' access to the computer

suites. They could not be afraid of extra workload, considering that they could contribute to the reform of the teaching, aiming at better learning outcomes. But this would assume a different value system in schools.

The wider context has been acknowledged by participants in the programme. There is need for a new breed of teachers who will be working under different conditions and having to respond to different demands.

10.7 Chapter Summary

In this chapter research findings are compared to the literature and evidence in order to be validated and placed in a wider context. The use of a table proved to be very useful for this goal. The validity of the findings was achieved through the similarities and differences found within the literature. A discussion touching on issues of Greek educational policy and system, school and teacher culture is provided. Explanations are given, based on this discussion, for the failing of in-service training programmes in Greece. In the next chapter, final conclusions deriving from the study and recommendations are presented.

CHAPTER 11: CONCLUSION

11.1 Introduction

The purpose of this last chapter is to look back at the study explaining how it has contributed to wider research in terms of methodology and knowledge and underlining any limitations. Recommendations for training programmes are made as well as avenues for further research.

My study investigated an in-service ICT training programme and identified the reasons why this training had little impact on teachers' practice. The context of this training was the Greek educational system, which was presented in detail. The research initially involved a comprehensive literature review of: educational change and reform; the introduction of ICT in the classroom; the barriers to ICT use; the role of the teacher in the implementation of ICT and the role of pre- and in-service training in ICT. The literature review established criteria for effective ICT in-service training. A combined research methodology was introduced along with the method of analysis. The main research tools were questionnaires distributed to the teachers, interviews held with the participants in combination with a few observation sessions of the training programme. The perspectives of teachers, head-teachers, teacher-trainers and programme designers were then described, creating a coherent picture of all the stages of the training, from planning to evaluation. Then a concept map was used to summarize the main phenomena as emerging from the

data. The research addressed implicitly all the questions presented at the beginning of the study:

1. What type of the innovation was planned and introduced and by whom?

The innovation aimed at developing teachers' use of ICT for subject teaching. Its key characteristic was top-down planning, which had not taken account of teachers' needs, in particular the question of on-going support. The conditions for facilitating teachers use of ICT were not considered in depth. Further details about the planning of the innovation are provided in Chapter 1, along with a brief presentation of the Greek educational context. Additional information is provided by the participants, which are reported in Chapters 5, 6, 7 and 8. A more critical and detailed picture is presented in the Discussion Chapter. Sub questions concerning the planning are addressed below.

- Who planned the programme?

The innovation was planned initially by research institutes and academics and then adopted and maintained by the Ministry of Education. Details about the planning are contained in Chapter 1, Chapter 8 and the Discussion Chapter.

- Was it a centralised or decentralised initiative?

It was a centralised initiative, proposed by the ministry, but with aspects of decentralization in the organisation of the training and its delivery. A key issue emerging particularly from programme designers was that it was an unsuccessful mix of centralised

and decentralised elements. In particular teacher-trainers lacked central support and a context in which they could share ideas.

It was a top down initiative taking place within a highly centralized framework. This framework in particular the role of set texts and traditional testing was not addressed. The decision over the continuation of the programme was taken at ministry level. However the programme was not given a high profile

On the other hand trainers stressed the lack of a stable framework for the training and the role of political intervention in the termination of the programme. The head-teachers put emphasis on the need for a training that would be part of a continuous process, in the appropriate environment, while the teachers would be given greater incentives in order to participate. Chapter 1, the responds of the teacher-trainers and programme-designers (Chapter 7 and 8) as well as the Discussion Chapter present information about this question.

2. What were the important characteristics of the EE training, according to perspectives of teachers, head-teachers, teacher-trainers and programme-designers regarding delivery, structure and content?

The training focused on teaching philological subjects with the use of ICT. There was teaching of IT skills but an attempt was made to present IT skills in a subject context. The teacher-trainers had as a main aim the introduction of new theories of learning, teaching and ICT pedagogy. The training however failed to address the differentiated needs of the

teachers. The EE training programme is described in great detail in Chapters 1, 5, 6, 7, 8 and Appendix IX.

- Did the training have an impact on teachers' practice?

The training had a limited impact on teachers' IT skills and some impact on their perception of ICT use. However it had very little impact on their practice – as confirmed by teachers, head-teachers, teacher-trainers and programme designers. Details of the impact of the training are given in Chapter 5,6,7 and 8.

- Which aspects of the training were most valued by the teachers?

The teachers appeared to value the idea of professional development and opportunities for in-service training. They valued being shown ways of using ICT in their subjects and they also valued being able to develop their IT skills. Their perceptions are thoroughly presented in Chapter 5.

- Which aspects of the training were least valued by the teachers?

Many teachers complained of the existence of two parallel programmes and the length of the training. Some felt their IT and ICT skills and subject needs were not addressed. They noted that there was lack of hands-on activities and opportunities of practice and observation. They did not value the emphasis teacher-trainers put on theories of learning, teaching and ICT pedagogy. Their perceptions are comprehensively presented in Chapter 5.

- To what extent did head-teachers support teachers?

The head-teachers were not supportive, or at least were often indifferent, regarding the introduction of ICT in their schools. Some of them were reluctant to let the training take place in their school. A few head teachers did not know that their teachers were attending the programme. The head-teachers perspectives are developed in Chapters 5,6,7 and 8.

- To what extent were teacher-trainers adequately prepared for their role?

Although they had attended a previous course themselves, the teacher-trainers were not adequately prepared for teaching the programme. Some teachers referred to their trainers' lack of subject knowledge and lack of pedagogical skills. The teacher-trainers expressed dissatisfaction towards their own training. They felt they lacked support during the training concerning the organisation of the training and its delivery. Details on the teacher-trainers' preparation is given in Chapters 1, 5, 7 and 8.

3. What problems emerged during the preparation and delivery of the programme?

There was agreement that there were significant problems associated with the planning of the innovation, the planning of the sessions and the delivery of the sessions. More details are provided in Chapter 9.

- How did designers and teacher-trainers take into account the existence of two programmes?

The two programmes seemed to function in parallel and the problems this caused were not taken into account. Teachers that had attended TSC previously lost interest when being

taught the same skills again. Teachers attending both programmes at the same time were tired and over committed.

The designers and teacher-trainers argued that TSC should precede EE for all teachers. Their views are presented in Chapter 8.

- Was the school environment appropriate for the school-based part of the training?

The school infrastructure was appropriate as there was a fully equipped computer suite. On the other hand, the teachers were not able to practice what they were learning as the suite was occupied most of the time by the specialist IT teacher. There were no arrangements to facilitate teachers in gaining access to the IT suite. The head-teachers, teacher-trainers and programme-designers felt the general school culture did not facilitate the introduction of ICT use in schools.

The views of the participants which are related to this question are presented in Chapter 5, 6, 7, 8 and the Discussion Chapter.

- Was there appropriate infrastructure and technical support?

During the delivery of the programme, there were often technical problems that the teacher-trainers had to solve by themselves. There were occasions of sessions being cancelled because of technical problems. Teachers mentioned the lack of appropriate software to use in their lessons. The lack of technical and subject support for teachers appeared as a crucial factor inhibiting ICT implementation. The lack of the appropriate infrastructure and support is shown in Chapter 5 and 7.

- Were there opportunities for hands-on work and lesson observations?

The teachers complained that they had too few opportunities for hands-on work as much of the session was spent on theories of learning and teaching. They had no opportunities to observe other teachers teaching with ICT. Their concerns are presented in Chapter 5.

4. What prevented or helped teachers to use ICT in their teaching?

All the participants referred to reasons that helped or prevented teachers from ICT use; the most frequently mentioned being the lack of time, the curriculum restraints, the lack of infrastructure, lack of support and lack of pressure. All these though have to be seen into a wider educational context. The reasons are presented in Chapters 5, 6, 7, 8, 9 and 10.

- Were the teachers provided with enough time to plan and implement the use of ICT?

There was no extra time for teachers to facilitate planning for the use of ICT in their teaching and this was a major reason for not using the computer suite as explained by teachers, head-teachers, teacher-trainers and programme-designers in Chapters 5, 6, 7, 8 and 10 mainly.

- Could teachers fit their use of ICT into the existing curriculum?

There was a general acceptance that it was very difficult for teachers to fit ICT into the existing curriculum. The curriculum was highly centralised and exam oriented leaving not a lot of space for teachers to improvise. In addition there was a lack of software related to

the specific curriculum. The lack of fit is put forward within all participants' responses (Chapter 5, 6, 7, 8 and Discussion Chapter).

- Were teachers supported and pressured to use ICT?

Teachers were neither supported nor pressured to use ICT. There was not any support or pressure from the Local Authorities, the School Administration or the head-teachers. The Certificate of Successful Attendance for the course required teachers to carry out lesson and that was a pressure for some. The lack of pressure or support emerges in Chapter 5, 6, 7, 8 and the Discussion Chapter.

The analysis of data endorses the view that the successful implementation of a change or innovation, such as the introduction of ICT in teaching and learning, cannot be a simple 'bolt on' activity (Hopkins, 2001, p. 2), but includes a set of processes and activities (Harris, 2002, p. 5) that must have coherence and efficiency (Charalambous and Karagiorgi, 2002). As is wisely observed (Demetriades *et al*, 2003) there is a need for continuous interaction between teachers and technology in order to develop an acceptable model of ICT in-service training, including testing, rejection and adoption of several elements. Educational changes involve social processes, and that is why they appear to be 'technically simple and socially complex' (Fullan, 1991, p.65). It is easy for someone to plan and initiate a change or innovation, but it is difficult to sustain and institutionalise it (Fullan, 2001, p. 35). As Huberman and Miles (1984) observe:

Taking continuation for granted assuming magically that it will happen by itself, or will necessarily result from a technically mastered, demonstrably effective project- is naïve and usually self-defeating.

(p. 14)

Any introduced educational change or innovation, even a small-scale one, needs to set a realistic time-scale to be successfully implemented (Fullan, 2001, p. 35; Harris, 2002, p. 40).

The successful implementation of ICT depends on many human and material factors, on factors related to the school and the teacher her/himself as the agent for carrying out the implementation and on external factors (Snoeyink and Ertmer, 2001; BECTA, 2004, p. 20). Human factors refer to the programme designers, the educators of teacher-trainers, the teachers themselves, their head-teachers, the IT teachers, the teacher-trainers, the advisory teachers or coordinators. Material factors include the school computer suites and equipment, the available software and infrastructure, the available time, the curriculum and so on. Human and material factors interact and interplay, but are also interlinked (BECTA, 2004, p. 21-22). For example, teachers who have not the time to evaluate software may also lack competence in using software which may in turn lead to lack of confidence and non use of ICT in classroom (BECTA, 2004, p. 21).

Ertmer (1999) adds that when the second order or internal barriers are addressed, teachers will be more ready to use ICT in their every day practice. Human factors are central in the low uptake of ICT by teachers (Davis *et al.*, 1997; Bonnett *et al.*, 1999; Rudd, 2000; Baki, 2000), but as discussed in Chapter 10, perspectives need to be seen in a wider context. The

example of the two teachers, who did use ICT in their classroom, shows that teachers can overcome the inhibiting factors that usually make teachers unable or unwilling to use ICT in their teaching. In general, the use or not of computers in classroom rests to a large degree on teachers' beliefs and their commitment (Clark and Peterson, 1986; Joyce, 1990; Fullan, 1991; Pelgrum and Plomp, 1993; Gilmore, 1994; Robertson *et al.*, 1996; Cox *et al.*, 1999; Higgins and Moseley, 2001).

11.2 Recommendations

The study indicates that for successful integration of ICT use in the educational context a multi-level intervention is necessary that addresses human and material factors as well as the needs of teacher-trainers, teachers, head-teachers and others who are engaged in the process. It further needs to secure the necessary infrastructure that will give teachers the opportunity to translate into practice what they theoretically learned during the training sessions (Harris, 2002, p. 31).

According to these an effective ICT training programme includes the following characteristics:

I. During the planning of the programme phase:

It has a decentralised character, avoids 'top-down' approaches, it fits with the wider educational system, it is not a 'one-off' event, it addresses the needs of the teachers and provides incentives to convince the teachers to take part either as trainers or as teachers.

II. During the planning of the sessions phase:

It selects teacher-trainers on the grounds of their ICT skills, their use of ICT for educational purposes and their pedagogical skills, and supports them through advisors, mentors and peers. It employs collaborative and differentiated techniques of teaching. It communicates its aims to the participant teachers and head-teachers of schools and secures in advance their support and cooperation in creating learning communities.

III. During the carrying out phase:

The teacher-trainers are supported by the head-teacher and the IT teacher and they meet periodically with other teacher-trainers to exchange views and explore in cooperation new approaches and practices. Special attention is given to the formation of homogenous groups taking into account the subject specialism of the participants and differentiated and individualised methods of teaching are sometimes employed. Updated software relevant to the curriculum and appropriate infrastructure are available, while combination of theory and practice and hands-on activities and practice are offered. Collaborative and interactive techniques of teaching are used, aiming at the creation and consolidation of communities of learning and practice. Evaluation of the process step by step and feedback are seen as necessary.

Teachers are released from their teaching duties during the whole course or during the days the sessions are held. They are pressed, but at the same time assisted, to perform the expected trial lessons in real settings with the use of ICT and at the same time are given

opportunities for mutual observation or observation of other experts. They are also given the opportunity to attend relevant sessions in the morning during the school day and they are financially assisted to purchase their own personal computer. At the end they are provided with a certificate for attending the training programme.

The IT teachers and the head teachers are obliged to provide the teacher-trainers with the assistance they need especially as regards the quantity and the quality of the available infrastructure and access to the school's computer suite.

The programme designers supervise and coordinate the process of the whole programme and provide the teacher-trainers with the needed instructions and advice. Furthermore, they proceed to a systematic, objective, comprehensive and reliable evaluation of the whole programme after its end and make the necessary reforms.

IV. After the training phase:

At the end of the training, teachers try to use the ICT in their teaching and are provided with follow-on school-based training, while IT teachers are obliged to support them. In addition, head teachers are authorised to exercise pressure on the IT teachers and the teachers as well, if needed, and provide them with the necessary technical and emotional assistance, having themselves attended a special training course on this matter.

Taken together these recommendations are not a recipe for success. Any programme takes place in a wider context in which status, culture and conditions of the teaching profession need to be considered.

11.3 Literature Contribution

This research makes an individual contribution to the literature in the sense that it is an investigation of a case of a training programme that, while helping some teachers develop their IT skills, was so obviously unsuccessful in that it had minimum impact on teachers' practice. The study recognizes this disappointing outcome and accounts for it. In doing so, the study provides an approach to training to be avoided and indirectly provides a mirror image of the criteria established for effective training. In many fundamental respects this study supports the literature on 'what works' by describing 'what does not'. This study further emphasizes the importance of the wider context work - something missed in other studies. It would be simplistic to see the 'fault' for the lack of impact of training programmes, and for the non-use of ICT in schools, as that the teachers or the teacher-trainers. Their actions need to be seen in the context of the severe structural difficulties within the Greek educational system.

A further contribution to the literature is that it provides a study of ICT in Greek schools - a context underrepresented in the international literature. The Greek educational context is an interesting one, a very centralised educational system, with issues of discontinuity and instability in terms of educational reforms and great continuity concerning the educational policy and governance. The study provides parallels for reforms and training programmes initiated in similar educational contexts. At the same time, it is remarkable that literature from largely US/UK contexts has crossed over so well in the understanding of the Greek educational context.

11.4 Methodological Contribution

Regarding methodology, the research used a variety of techniques, including observation, questionnaires, interviews, literature review and document analysis. Data were collected from all the people involved in the project, such as teachers, head-teachers, teacher-trainers and training programme designers, while the training was explored at every stage: the planning of the programme, the planning of the sessions, the implementation and its impact. In this way, the study offered a holistic view of the phenomenon under examination triangulating data from various sources. The data from the interviews and questionnaires were combined and their synthesis was presented. Of course to a great or lesser extent most studies use a mix of methods but rarely do they give explicit examples of the triangulation employed. Due to lack of time and of financial resources, many studies tend to collect data from one source, which is usually the teachers (BECTA, 2004) or to use one method of data collection; only interviews (Butler and Sellbom, 2002; Guha, 2000) or only questionnaires (Snoeyink and Ertmer, 2001; Russel and Bradley, 1997).

In addition, this research has made an important contribution to framing a literature review. The review began by looking at innovation and change in education, then the role of training, effective in-service training and the traits of effective in-service ICT training. Through this deductive method of literature review, a comprehensive picture of what lies beneath planning, implementation and evaluation of an ICT in-service training was created. This approach enabled me to decide on the most important issues and specific research questions for designing the study. Such a broad approach to literature review is

rarely used because of lack of time or simply lack of scientific rigor. Most reported studies restrict themselves to ICT related studies.

Another methodological contribution of my research is the use of the concept map. Usually social sciences research is very text oriented, providing data reports and their analysis in long text forms, which can make it difficult to acquire a global perception of the problem or issue presented. The use of concept map presents schematically all the factors involved in the training programme and points out the causal relationships between factors. A combination of text and a map gives the analysis greater clarity and makes it easier for the audience to access and check the validity of the analysis. Of course this study is not unique in its use of a concept map but it is unusual.

11.5 Limitations of the Study

There are of course several limitations in the study:

1. **Initial research design:** Initially, I was aiming to observe the EE ICT in-service training sessions which were to be carried out during the academic year 2003-2004 and to investigate them, in addition to the interviews, the questionnaires and the classroom observations. But while preparations such as observation schedule and evaluation sheets were ready, the continuation of the ICT teacher in-service training process was postponed and finally cancelled. That caused disturbance in the flow of the research and I had to make changes in my plans and aims. I observed only one EE training session along with several TSC sessions.

2. Engagement with teachers: my initial idea was to initiate a closer relationship with the teachers and their practice. I wanted to be able to follow them in their everyday activities, discuss with them their teaching practices and observe their teachings. Unfortunately, that was not feasible. I had to deal with sensitivity about the lack of success in the training programme and the culture of lack of openness in school. The Greek teachers are often unwilling to 'lose' time on research and although they were willing to participate, they were not ready to go beyond interviews and questionnaires. It was only by participant observation that I could extend the study. Becoming a teacher would enable me to experience school life and investigate areas, which are not accessible to 'outsiders'. For example, eight of the teachers refused to be tape-recorded. This might have happened, because they were feeling threatened or insecure towards the researcher or simply not used to the process.

Another factor that limited this study was the lack of teaching experience on my behalf. I had no working experience in a school. On the other hand, my MA degree in Educational Studies, my personal readings and some visits to schools gave me a quite clear view of the Greek educational system and made me feel confident in conducting this particular research. I did not feel that my gender and age were a deterrent to teachers' participation in the research. On the contrary, my relatively young age seemed to make the interviewees more willing to talk and offer to me their assistance.

Despite the difficulties, being a native Greek speaker made it easier for me to investigate this programme, since it was in a Greek context. It demanded more effort in terms of

translation, consistency in vocabulary and cultural aspects. Every possible effort was made for not distorting the data and for conveying the particular features of the Greek language and culture.

3. The sample: The sample for this study consisted of philology teachers (teachers who teach Ancient Greek, Modern Greek, History, Latin, Citizenship as well as Religious Education and Psychology). Further research could compare the outcomes of this training with the training for science teachers for example. Further comparisons could be made on gender, levels of computer use, access to computer at home and age.

In general, the management of a large amount of data in the form of documents, interview transcripts from several sources, questionnaires and observation schedules was a complex and time consuming task. However, this is counter-balanced by the fact that towards the end of the study all these various and seemingly incoherent elements appeared to come together to build a coherent picture.

4. The wider context: This only became apparent during the course of the research. There were opportunities, which were not taken up earlier to explore teacher attitudes to educational policy and their status as teachers in Greek society.

11.6 Further Research

Further research might address:

- The experience of teachers of working in other levels of education towards the same or similar training;
- Examples of teachers who do use ICT and who have successfully integrated ICT across the curriculum;
- Barriers in more detail to find out how they are interlinked and affect the implementation of ICT in teaching and learning;
- Evaluation of lessons incorporating ICT and the degree they are simply trying to assimilate new tools in an existing teaching approach;
- Investigation of the way teacher-trainers are selected and trained to carry out their training task;
- The relationship between initial or pre-service and in-service training in relation to use of ICT.

11.7 Chapter Summary

This is a study which shows that educational change is about people. I believe that it shows the importance of the human factor in the success of ICT training programmes. Teachers need to be considered more carefully in order to enhance teaching profession. Without a determined and coordinated policy, and a collaboration of all agents engaged in this process either directly or indirectly, it is improbable that ICT will be successfully implemented in educational purposes.

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APPENDIX I

OBSERVATION SCHEDULE

I. Physical setting

Number of computers	
Slides' show	
Projector	
White board	
Paper- hand outs	
Books	
Keeping notes	

Number of trainees	
--------------------	--

Activities- Taught elements	
ICT skills	
Teaching preparation	
Organisation of classroom	
Implications of how the function can be used to achieve objectives in teaching	
Evaluating pupil's performance when computer is used	
Software	
Internet	
Legal considerations	
Ethical issues	
Health- safety	

II. Events

Description (events in sequence)	Duration

III. Practice

In pure Skills	In subject context

APPENDIX II

I. QUESTIONNAIRE IN ENGLISH

Section I: General personal questions

1. Are you Male

Female

2. Are you Under 25

25- 29

30- 39

40- 49

50- 59

Over 60

3. Which of the following qualifications do you hold? For each write in the main subject (Tick all which apply).

BA Subject.....

BSc Subject.....

Bed Subject.....

MA Subject.....

MSc Subject.....

PhD Subject.....

Other (Please specify below).....

4. Which is your main teaching subject?

.....

5. How many years of teaching experience had you had at the start of this school year?

1-5

6-10

11-15

16-20

21-25

26-30

6. Do you own a computer? (If the answer is NO, go to question No. 9)

Yes

No

7. How long have you owned a computer?

Less than 2 months

From 2 months to 1 year

2-3 years

4-8 years

More than 8 years

8. Do you have an Internet connection at home?

Yes

No

9. Do you use a computer for any purposes not connected to teaching?

Yes

No

10. In this table fill in with V all the tasks you can perform and where you were taught how to do it.

	I don't know how to do it	I was taught that in EE	I knew it from before the EE.
Text writing			
Presentations			
Spreadsheets			
Data from Internet			
Games			
Data from cd-roms			
Creation of diagrams			
Send and receive emails			
Communication on line with other schools			

1. Do you use a computer for your teaching preparation?

Yes

No

If Yes, please fill in the table.

	Once p.month	1 p. week	2+ p.w.	Everyday
Text writing				
Presentations				
Spreadsheets				
Data from the Internet				
Games that help learning				
Data from CD- roms				
Creation of diagrams				
Send and receive emails				
Communication online with other schools				

2. Do you use computer(s) in your instruction?

Yes

No

If Yes, please fill in the table.

	I used it once	Once p.month	1+ p.w.	2+p.week	Everyday
Text writing					
Presentations					
Spreadsheets					
Data from the Internet					
Games that help					

learning					
Data from CD- roms					
Creation of diagrams					
Send and receive emails					
Communication online with other schools					

3. Have you received any seminar/ training on computers for teaching before this one?

Yes

No

If Yes,

a) Which one(s) have you received? (Tick all which apply)

In- service training organized by your school

In- service training organized by your LEA

Pre- service training as course for your university degree

Observing other teachers in action.

Seminars in private institutions

Guide from friends

b) Which one do you consider that it was more helpful (If you had more than one)?.....

4. Did you feel confident in using computers in your teaching before coming here?

Yes

No

Section II: About the particular training

Please read the following statements and tick the box, which comes closest to your feelings about each one.

	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. The training sessions were too long.					
2. Too much was crammed into short time.					
3. I did not learn too many new things.					
4. Too much time was spent on known topics.					
5. There was no feedback after the tasks.					
6. There were no examples related to my subject.					
7. There should have been more examples of how to use computers in the classroom.					
8. The training did not contain many opportunities to practice the use of computers in classroom.					
9. The training concentrated on developing my personal computer skills.					

10. The training did not develop my knowledge of pedagogy of using computers in classrooms.					
11. The training developed my computer skills.					
12. I had many opportunities for cooperation with the other teachers.					
13. The trainer was not competent on the use of computers.					
14. The trainer was very knowledgeable on the use of computers in the classroom.					
15. The trainer was not knowledgeable in my subject.					
16. I have no idea how to enhance pupils' learning with the help of computers.					
17. I did not have enough training in order to use computers in the classroom effectively.					
18. I was completing successfully the task that the trainer was giving us					
19. We many times had problems to get online in the lab.					
20. There were many technical problems in the lab during the seminar.					
21. There are many CD- Roms that I could use in my teaching					

22. The lab was appropriately designed and it was corresponding to my needs					
23. I lost my motivation for learning during the seminar					
24. I will be using computers during my teaching					

Section III: How do you feel about computers in the classroom?

	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. Using computers in the classroom can motivate pupils' learning.					
2. Computers are wasting too much precious time.					
3. Computers give the chance for valuable group work.					
4. The computer causes disturbance in the classroom.					
5. Girls do not use computers as effectively as boys.					
6. The computer can in many cases substitute the teacher.					
Computers in teaching demand a great consume of resources which is not justified by its results.					
8. Computer allows for valuable teaching points, which might not be seen with another method.					
9. Pupils are better in using computers than the teachers					

10. I can be a effective teacher without using computers in classroom					
11. My school has the necessary equipment I need in order for me to use computers.					
12.The more I use computers the more I realize that it can lead to better learning results					
13. I would like to stay informed for the progress in educational technology					
14. Using computers is making teaching more pleasant					
15. I have confidence in my use of ICT					
16. Technical IT problems scare me					
17. Incorrect use of computers in the teaching can have negative effect on the pupils.					

II. QUESTIONNAIRE IN GREEK

Αγαπητοί Συνάδελφοι,

Το ερωτηματολόγιο αυτό αποτελεί μέρος έρευνας για την εκπόνηση διδακτορικής διατριβής με θέμα την επιμόρφωση των καθηγητών στους ηλεκτρονικούς υπολογιστές με σκοπό την αξιοποίησή τους στην τάξη.

Η εμπειρία σας και οι απόψεις σας είναι πολύτιμες. Η έρευνα σε κάθε περίπτωση θα διατηρήσει την ανωνυμία σας και το απόρρητο των απόψεων σας.

Σας ευχαριστώ για τη συνεργασία

Ελπινίκη Φραγκούλη

ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ

Μέρος Ι: Γενικές προσωπικές πληροφορίες

1. Φύλο : Γυναίκα

Άνδρας

2. Ηλικία : Μέχρι 25

25-29

30-39

40-49

50-59

60+

3. Ποιο/ ποιους από τους παρακάτω τίτλους έχετε;

Πτυχίο σε.....

Μετεκπαίδευση στη ΣΕΛΜΕ

Μετεκπαίδευση στο ΔΜΕ

Μετεκπαίδευση εσωτερικού - αποκτηθείς τίτλος

Μεταπτυχιακό στ.....

Διδακτορικό στ.....

Μετεκπαίδευση εξωτερικού

Μάστερ στ.....

Διδακτορικό στ.....

Κάτι άλλο (ονομάστε το).....

4. Ποιο μάθημα διδάσκετε στο σχολείο ως επί το πλείστον;

.....

5. Χρόνια υπηρεσίας:
- | | |
|-------|--------------------------|
| 1-5 | <input type="checkbox"/> |
| 6-10 | <input type="checkbox"/> |
| 11-15 | <input type="checkbox"/> |
| 16-20 | <input type="checkbox"/> |
| 21-25 | <input type="checkbox"/> |
| 26-30 | <input type="checkbox"/> |

6. Έχετε Η/Υ στο σπίτι σας;

(Αν η απάντηση είναι ΟΧΙ προχωρήστε στην ερώτηση αριθμ. 9)

Ναί

Όχι

7. Για πόσο χρονικό διάστημα έχετε τον Η/Υ στο σπίτι σας;

Λιγότερο από δύο μήνες

Από 2 μήνες ως ένα έτος

2-3 χρόνια

4-8 χρόνια

Περισσότερο από οκτώ χρόνια

8. Έχετε σύνδεση με το INTERNET στο σπίτι σας;

Ναι

Όχι
9. Χρησιμοποιείτε τον υπολογιστή για λογους που δε συνδέονται με το σχολείο;

Ναι

Όχι

10. Στον παρακάτω πίνακα, σημειώστε με το σύμβολο V όλες τις εργασίες που γνωρίζετε να εκτελείτε και πού τις έχετε διδαχτεί (Ενδοσχολική Επιμόρφωση κλ.π.).

	Δεν γνωρίζω	Το διδάχτηκα στην Ε.Ε.	Το ήξερα από παλιά
Επεξεργασία κειμένου			
Παρουσιάσεις			
Υπολογιστικά φύλλα			
Άντληση πληροφοριών από το διαδίκτυο			
Παιχνίδια που βοηθούν στη μάθηση			
Άντληση πληροφοριών από CD-Roms			
Δημιουργία διαγραμμάτων			
Αποστολή και παραλαβή e-mail			
Επικοινωνία στο διαδίκτυο με άλλα σχολεία			

11. Χρησιμοποιείτε Η/Υ για την προετοιμασία του διδακτικού σας έργου;

Ναι

Όχι

(Αν η απάντηση είναι ΝΑΙ, παρακαλώ σημειώστε ποιες εργασίες εκτελείτε και πόσο συχνά)

	Μία φορά το μήνα	Μία φορά τη βδομάδα	2 φορές και περισσότερες τη βδομάδα	Καθημερινά
Επεξεργασία κειμένου				
Παρουσιάσεις				
Υπολογιστικά φύλλα				
Άντληση πληροφοριών από το διαδίκτυο				
Παιχνίδια που βοηθούν στη μάθηση				
Άντληση πληροφοριών από CD-Roms				
Δημιουργία διαγραμμάτων				
Αποστολή και παραλαβή e-mail				
Επικοινωνία στο διαδίκτυο				

με άλλα σχολεία				
--------------------	--	--	--	--

12. Χρησιμοποιείτε Η/Υ στη διδασκαλία ;

Ναι

Όχι

(Αν η απάντηση είναι ΝΑΙ ,παρακαλώ συμπληρώστε τον παρακάτω πίνακα για να δηλώσετε πόσο συχνά χρησιμοποιείτε Η/Υ γι' αυτό το σκοπό)

	Τον χρησιμοποίησα μία φορά	Μία φορά το μήνα	Μία φορά τη βδομάδα	2 φορές και περισσότερες τη βδομάδα	Καθημερινά
Επεξεργασία κειμένου					
Παρουσιάσεις					
Υπολογιστικά φύλλα					
Άντληση πληροφοριών από το διαδίκτυο					
Παιχνίδια που βοηθούν στη μάθηση					
Άντληση πληροφοριών από CD- Roms					
Δημιουργία διαγραμμάτων					

Αποστολή και παραλαβή e-mail					
Επικοινωνία στο διαδίκτυο με άλλα σχολεία					

13. Είχατε αποκτήσει κάποια εμπειρία σχετική με τη χρήση Η/Υ στη διδασκαλία πριν από την είσοδό σας στο παρόν επιμορφωτικό πρόγραμμα;

Ναι

Όχι

Αν η απάντηση είναι ΝΑΙ,

α. παρακαλώ σημειώστε όποιο/-α σας αντιστοιχεί/-ούν

Σεμινάριο που οργανώθηκε από το σχολείο σας

Σεμινάριο που οργανώθηκε από άλλον εκπαιδευτικό φορέα

(Παιδαγωγικό Ινστιτούτο, ΥΠΕΠΘ, Σχολικούς Συμβούλους κ.λπ.)

Σεμινάριο που οργανώθηκε από ιδιωτικούς φορείς

Σχετικά μαθήματα -μέρος του προγράμματος -στη διάρκεια της φοίτησής σας στο Πανεπιστήμιο

Παρακολουθώντας άλλους εκπαιδευτικούς να χρησιμοποιούν Η/Υ στη διδασκαλία τους

Βοήθεια / καθοδήγηση από φίλους

β. Ποιο από τα παραπάνω θεωρείτε πως ήταν πιο αποτελεσματικό και χρήσιμο ;

.....

14. Είχατε εμπιστοσύνη στον εαυτό σας σχετικά με τη χρήση Η/Υ στη διδασκαλία πριν από την είσοδό σας στο παρόν επιμορφωτικό πρόγραμμα;

Ναι

Όχι

Μέρος ΙΙ: Πληροφορίες σχετικές με το παρόν επιμορφωτικό σεμινάριο-πρόγραμμα

Παρακαλώ, διαβάστε τις παρακάτω θέσεις και σημειώστε V στο τετράγωνο που συμφωνεί περισσότερο με την προσωπική σας άποψη σχετικά με την κάθε μια.

	Διαφωνώ πλήρως	Διαφωνώ	Δεν είμαι σίγουρη/ -ος	Συμφωνώ	Συμφωνώ πλήρως
1. Το επιμορφωτικό πρόγραμμα είχε μεγάλη διάρκεια					
2. Πολλή διδακτέα ύλη συμπίεστηκε σε λίγο χρόνο					
3. Δεν έμαθα πολλά πράγματα					
4. Πολύς χρόνος δαπανήθηκε σε πράγματα γνωστά					
5. Δε γινόταν ανατροφοδότηση μετά από κάθε μου εργασία.					
6. Δεν χρησιμοποιήθηκαν παραδείγματα σχετικά με το αντικείμενό μου					
7. Χρειάζονταν περισσότερα παραδείγματα σχετικά με τη χρήση των Η/Υ στην τάξη					
8. Το επιμορφωτικό πρόγραμμα δεν περιείχε πολλές ευκαιρίες πρακτικής εξάσκησης στη χρήση Η/Υ στην τάξη					

9. Το επιμορφωτικό πρόγραμμα επικεντρώθηκε στην ανάπτυξη των δεξιοτήτων στη χρήση των Η/Υ					
10. Το επιμορφωτικό πρόγραμμα δε βελτίωσε τις παιδαγωγικές μου γνώσεις σχετικά με τη χρήση των Η/Υ στην τάξη					
11. Το επιμορφωτικό πρόγραμμα ανέπτυξε τις δεξιότητές μου στη χρήση Η/Υ					
12. Είχα πολλές ευκαιρίες συνεργασίας με τους συναδέλφους μου					
13. Ο επιμορφωτής δεν είχε επαρκείς γνώσεις σχετικά με τη χρήση Η/Υ γενικά					
14. Ο επιμορφωτής ήταν πολύ ενημερωμένος σχετικά με τη χρήση Η/Υ στην τάξη					
15. Ο επιμορφωτής δεν είχε αρκετές γνώσεις πάνω στον τομέα της ειδικότητας μου.					
16. Δεν έμαθα τρόπους βελτίωσης της διδακτικής και μαθησιακής διαδικασίας με τη βοήθεια των Η/Υ					
17. Τα σεμινάρια δεν ήταν επαρκή, για να μπορώ να χρησιμοποιώ υπολογιστή στην τάξη.					
18. Πολλές φορές ολοκλήρωνα επιτυχώς την εργασία που μου ανέθετε ο εκπαιδευτής					
19. Πολλές φορές είχαμε δυσκολίες να συνδεθούμε με το διαδίκτυο.					
20. Υπήρχαν πολλά τεχνικά προβλήματα με τη					

λειτουργία του εργαστηρίου κατά τη διάρκεια των σεμιναρίων.					
21. Υπάρχει πληθώρα λογισμικού που θα μπορούσα να χρησιμοποιήσω στο μάθημά μου					
22. Το εργαστήριο ήταν κατάλληλα διαμορφωμένο και ανταποκρινόταν στις ανάγκες μου					
23. Έχασα το κίνητρο για μάθηση κατά τη διάρκεια του σεμιναρίου.					
24. Θα χρησιμοποιώ υπολογιστές κατά τη διδασκαλία των μαθημάτων					

Μερος III: Πληροφορίες σχετικές με την πίστη σας όσον αφορά την αποτελεσματικότητα της χρήσης των Η/Υ στην τάξη.

Παρακαλώ, διαβάστε τις παρακάτω θέσεις και σημειώστε **V** στο τετράγωνο που συμφωνεί περισσότερο με την προσωπική σας άποψη για την κάθε μια.

	Διαφωνώ πλήρως	Διαφωνώ	Δεν είμαι σίγουρη/- ος	Συμφωνώ	Συμφωνώ πλήρως
1. Η χρήση των Η/Υ στην τάξη μπορεί να κινήσει το ενδιαφέρον των μαθητών για μάθηση					
2. Η χρήση των Η/Υ στην τάξη απαιτεί δαπάνη πολύτιμου χρόνου για τη διδασκαλία					
3. Η χρήση των Η/Υ στην τάξη προσφέρει στους μαθητές εξαιρετική ευκαιρία για ομαδική εργασία					

4. Ο υπολογιστής αποτελεί εμπόδιο στην ομαλή λειτουργία της τάξης.					
5. Η χρήση των Η/Υ στην τάξη αδικεί τα κορίτσια που δεν χρησιμοποιούν τον Η/Υ τόσο αποτελεσματικά όσο τα αγόρια					
6. Ο Η/Υ μπορεί να αντικαταστήσει τον καθηγητή					
7. Η χρήση των Η/Υ στην τάξη είναι μια δαπάνη που δεν δικαιολογείται από τα αποτελέσματά της					
8. Η χρήση των Η/Υ στην τάξη μπορεί να έχει αποτελέσματα που δεν θα μπορούσαν να επιτευχθούν με τον παραδοσιακό τρόπο διδασκαλίας					
9. Οι μαθητές είναι καλύτεροι στη χρήση υπολογιστών από ό,τι οι καθηγητές.					
10. Μπορώ να είμαι καλός καθηγητής χωρίς να χρησιμοποιώ υπολογιστή στην τάξη.					
11. Το σχολείο μου διαθέτει τον καταλληλό εξοπλισμό, ώστε να μπορώ να χρησιμοποιώ υπολογιστή στην τάξη.					
12. Όσο πιο πολύ χρησιμοποιώ τον υπολογιστή, τόσο πιο πολύ συνειδητοποιώ ότι μπορεί αυτός να βοηθήσει να επιτύχω καλύτερα μαθησιακά αποτελέσματα.					
13. Έχω την πρόθεση να ενημερώνομαι για τις εξελίξεις στην εκπαιδευτική τεχνολογία.					
14. Η χρήση Η/Υ στην τάξη κάνει το μάθημα πιο ευχάριστο.					
15. Έχω εμπιστοσύνη στις ικανότητές μου για χρήση					

υπολογιστών στην τάξη.					
16. Τα τεχνικά προβλήματα των υπολογιστών μου προξενούν φόβο.					
17. Η μη σωστή χρήση των Η/Υ στην τάξη μπορεί να έχει καταστρεπτικά αποτελέσματα για τους μαθητές					

APPENDIX III

I. QUESTIONS FOR TEACHERS IN ENGLISH

Personal information

Do you have a computer at home?

Do you use computers at all? For which purposes?

What progress have you made during the course?*

How have you applied what you learnt to your teaching work?*

Training

What is your perception of the quality of the training?*

What did you get from the training?

Was the training relevant to your needs as far as it concerns IT skills and subjects' examples?

Were there teachers that could not keep up with the training's pace?

Have you prepared any schedule for teaching? Portfolio?

How many times?

How much time did it take you?

Did you find it helpful?

Does the training motivate you and make you want to try out what you have learnt?

Did the training introduce you to new teaching methods? How did you react to that?

Did you have any kind of cooperation with the other teachers?

During the training? After the training?

Do you discuss with the other teachers any work related problems? When is that happening?

Would you like more cooperation? Why is not happening now?

Were you able to experiment on what you were learning?

When were you experimenting?

What deterred you from experimenting?

Experimental teaching

What was pupils' attitude towards the teaching? Do you believe that learning was taking place?

Was the teaching style different from your traditional one?

Did all the teachers do experimental teaching? Why didn't all the teachers do?

Why didn't you do an experimental teaching?

Did you face any difficulties in your teaching? Did that affect you and how?

How would be the ideal environment for a lesson with computers?

How is that different from the reality?

Are there difficulties now?

Were you able to practice what you were learning?

Ask about a specific teaching they did, to think and tell:

The learning objectives

The nature of the activities

The role of the ICT to achieve the objectives

Your role of you as teacher and your interactions with the role of ICT.

Your knowledge of the pupils' knowledge, skills and abilities including their ICT capability that lead to your planning decisions?

What did the pupils learned and the evidence for their learning?

How was your teaching different using ICT than when you taught it previously without the ICT facilities?

Other training

Did you attend the KSE and when?

Are you satisfied by what you learned in KSE?

Do you know if there is software available for your subjects?

How did you get to know these?

Do you know e- yliko? What is it about? Have you used it?

School environment

Is the level and quality of support sufficient to enable you to gain maximum benefit from the training and put what you have learnt into practice?

Do you assess easily the appropriate resources when you need them?*

Has the headteacher or the inspector ever asked you to use computers?

Have you ever discussed about it with them?

How would you feel if you were asked to use computers?

Is there any kind of appraisal concerning your efforts?

How do you feel about that?

How does that affect the school's culture?

Do you think teaching with computers could be compulsory, now that you had this training?

Which are the reasons for not using computers in the classroom?

What would you suggest it should change in the training?

Teachers who use computers in teaching

What are the obstacles you are facing and how do you get over them?

Why do you think the other teachers do not use computers in their teaching?

In what way are you different from them?

Perceptions

What do you feel are the main advantages of using ICT in your teaching?

What do you feel are the main disadvantages of using ICT in your teaching?

Can you use ICT and progress with your curriculum at the same time?

What are the constraints to the further development of your use of ICT in teaching and learning?

What are your reasons for using ICT with your pupils?

Do you have any evidence that pupils learn better when using ICT? In particular ways?

What skills and knowledge does the teacher need?

What skills and knowledge do the pupils need?

II. QUESTIONS FOR TEACHERS IN GREEK

Προσωπικές ερωτήσεις

Έχετε υπολογιστή στο σπίτι;

Χρησιμοποιείτε υπολογιστή καθόλου? Για ποιό σκοπό;

Τι πρόοδο έχετε κάνει κατά τη διάρκεια του σεμιναρίου;

Πώς έχετε εφαρμόσει στη δουλειά σας αυτά που μάθατε;

Σεμινάριο

Ποιά είναι η άποψη σας για την ποιότητα του σεμιναρίου;

Ανταποκρινόταν το σεμινάριο στις ανάγκες σας όσον αφορά το περιεχόμενο των παραδειγμάτων και τις τεχνικές γνώσεις;

Υπήρχαν καθηγητές που δεν μπορούσαν να συμβαδίσουν με το ρυθμό του σεμιναρίου

Έχετε ετοιμάσει κάποιο σχέδιο μαθήματος; Πορτφόλιο;

Πόσες φορές;

Πόσο χρόνο σας πήρε;

Το θεωρήσατε βοηθητικό;

Σας κινητοποίησε σε βαθμό που να θέλετε να δοκιμάσετε στην πράξη αυτά που μάθατε;

Σας εισήγαγε σε νέες μεθόδους διδασκαλίας; Πώς αντιδράσατε σε αυτό;

Είχατε κάποια μορφή συνεργασίας με άλλους καθηγητές; Κατά τη διάρκεια ή μετά το σεμινάριο;

Συζητάτε με άλλους καθηγητές προβλήματα εργασίας; Πότε συμβαίνει αυτό;

Θα θέλατε περισσότερη συνεργασία; Γιατί δεν συμβαίνει αυτό τώρα;

Είχατε περιθώρια να πειραματίζεστε πάνω σε αυτά που μαθαίνατε;

Πότε;

Τί σας εμπόδισε από τον πειραματισμό;

Πειραματική διδασκαλία

Ποιά ήταν η αντίδραση των μαθητών στη διδασκαλία; Πιστεύετε ότι οι μαθητές έμαθαν πράγματα;

Ήταν η μέθοδος διδασκαλίας διαφορετική από τη μέθοδο που χρησιμοποιείτε συνήθως;

Έκαναν όλοι οι καθηγητές πειραματική διδασκαλία; Γιατί δεν έκαναν;

Γιατί εσείς δεν κάνατε;

Αντιμετωπίσατε δυσκολίες κατά τη διδασκαλία; Πώς σας επηρέασε αυτό;

Πώς θα ήταν το ιδανικό περιβάλλον για μάθημα με υπολογιστή;

Πόσο διαφορετικό είναι αυτό από την πραγματικότητα;

Υπάρχουν δυσκολίες τώρα;

Ερωτήσεις για μια διδασκαλία που έκαναν να σκεφτούν και να πούν

Τους σκοπούς του μαθήματος

Το είδος των ασκήσεων

Το ρόλο του υπολογιστή στο να πετύχετε αυτούς τους σκοπούς

Ο ρόλος σας σαν καθηγητής και η σχέση σας με το ρόλο του Η/Υ

Η γνώση σας όσον αφορά τη γνώση Η/Υ των μαθητών.

Τί έμαθαν οι μαθητές και πώς το καταλάβατε;
Σε τί διέφερε η διδασκαλία σας από τότε που διδάξατε την ενότητα χωρίς Η/Υ

Προηγούμενα σεμινάρια

Παρακολούθησατε το ΚΣΕ και πότε;
Είσατε ικανοποιημένη με αυτά που διδαχτήκατε στο ΚΣΕ;
Γνωρίζετε λογισμικά για το αντικείμενο σας;
Πώς τα γνωρίζατε;
Γνωρίζετε το ε- υλικό; Με τι είναι σχετικό; Το έχετε χρησιμοποιήσει;

Σχολικό περιβάλλον

Είναι το επίπεδο και η ποιότητα υποστήριξης αρκετή για να αξιοποιήσετε ότι μάθατε και να τα θέσετε σε εφαρμογή;
Μπορείτε να έχετε στη διάθεση σας τους Η/Υ όποτε τους χρειαστείτε;
Σας ζήτησε ο διευθυντής ή ο επιθεωρητής να χρησιμοποιήσετε το Η/Υ
Έχετε ποτέ συζητήσει ποτέ για αυτό;
Πώς θα αντιδρούσατε αν σας ζητούνταν να χρησιμοποιήσετε
Υπάρχει κάποιο είδος επιβράβευσης των προσπαθειών σας;
Πώς νιώθετε για αυτό;
Πώς επηρεάζει την λειτουργία του σχολείου;
Νομίζετε ότι διδασκαλία με Η/Υ θα μπορούσε να είναι υποχρεωτική μετά από την παρακολούθηση του σεμιναρίου;
Για ποιούς λόγους δεν χρησιμοποιείτε Η/Υ;
Τι θα προτεινάτε να αλλάξει στο σεμινάριο ή στο σχολείο για να μπορείτε να διδάσκετε με Η/Υ;

Καθηγητές που χρησιμοποιούν Η/Υ

Ποιά εμπόδια συναντάτε και πώς τα ξεπερνάτε; Για ποιούς λόγους νομίζετε ότι οι άλλοι καθηγητές δεν χρησιμοποιούν Η/Υ;
Ως προς τί είστε διαφορετικοί από εκείνους;

Στάσεις απέναντι στους Η/Υ

Ποιά νομίζετε ότι είναι τα κύρια πλεονεκτήματα και μειονεκτήματα στη χρήση Η/Υ στη διδασκαλία;
Νομίζετε πως γίνεται να χρησιμοποιείτε Η/Υ και να προχωρείτε στην ύλη σας ταυτόχρονα;
Θα επιθυμούσατε παραπέρα επιμόρφωση;
Ποιά είναι τα εμπόδια για την παραπέρα επιμόρφωση σας στους Η/Υ;
Για ποιούς λόγους θα χρησιμοποιούσατε Η/Υ με τους μαθητές σας;
Έχετε ενδείξεις ότι οι μαθητές μπορεί να μαθαίνουν καλύτερα με τη βοήθεια του Η/Υ; Με συγκεκριμένους τρόπους μαθαίνουν περισσότερο από ότι με άλλους;
Τί γνώσεις και ικανότητες χρειάζεται ο καθηγητής για να μπορεί να διδάξει με Η/Υ;
Τί ο μαθητής?

APPENDIX IV

I. QUESTIONS FOR HEADTEACHERS IN ENGLISH

Personal details

Do you have a computer at home?

Have you attended any training?

Do you use computers at all? For which purposes?

About and during the training

Have you discussed with the teachers about the training?

What is your perception of the quality of the training?*

Do you know:

Has the training improved teachers' overall performance? In what ways?

Was the training relevant to their needs as far as it concerns IT skills and subjects' examples?

Were there teachers that could not keep up with the training's pace?

Did the training motivate them and make them want to try out what they have learnt?

The training introduced the teachers to a different pedagogy of teaching. How did teachers react to that?

Did the teachers have opportunities to practice what they were learning?

Have you noticed any kind of cooperation with among the teachers concerning ICT?

During the training? After the training?

Do you discuss with the other teachers any work related problems? When is that happening?

Would you like more cooperation? Why is not happening now?

Did you attend any teaching with computers that the teachers did?

What was pupils' attitude towards the teaching? Do you believe that learning was taking place?

Was the teaching style different from the traditional one?

Did all the teachers do experimental teaching? Why didn't all the teachers do?

How would be the ideal environment for a lesson with computers?

How is that different from the reality?

Are there difficulties now?

School environment

Is the level and quality of support sufficient to enable them to gain maximum benefit from the training and put what they have learnt into practice?

Does the school have any software available for the different subjects?

How did you get these?

Do you know e- yliko? What is it about? Have you used it?

Have you ever asked the teachers to use computers?

Is there any kind of appraisal concerning teachers' efforts?

How do you feel about that?

How does that affect the school's culture?

What are the obstacles teachers are facing in teaching with computers and how do they get over them?

Why do you think some teachers do use computers in their teaching?

In what way are they different from the others?

Do you think teaching with computers could be compulsory, now that they had this training?

Perceptions

Do you believe that computers can offer to the teaching?

What do you feel are the main advantages of using ICT in teaching?

What do you feel are the main disadvantages of using ICT in teaching?

What are the constraints to teachers' further development of use of ICT in teaching and learning?

What are your reasons for using ICT with your pupils?

Do you think they can use ICT and progress with the curriculum at the same time?

What skills and knowledge does the teacher need?

What skills and knowledge do the pupils need?

II. QUESTIONS FOR HEAD-TEACHERS IN GREEK

Προσωπικές πληροφορίες

Έχετε Η/Υ στο σπίτι;

Έχετε παρακολουθήσει κάποιο σεμινάριο?

Χρησιμοποιείτε Η/Υ;

Για ποιό σκοπό;

Σχετικά με το σεμινάριο

Έχετε συζητήσει το σεμινάριο με τους καθηγητές;

Ποιά είναι η εκτίμηση σας για την ποιότητα του σεμιναρίου;

Γνωρίζετε:

Αν το σεμινάριο έχει βελτιώσει την επίδοση των καθηγητών. Όχι προς τί;

Αν το σεμινάριο ανταποκρινόταν στις ανάγκες των καθηγητών ως προς τις βασικές δεξιότητες και τα παραδείγματα τα σχετικά με το αντικείμενο διδασκαλίας;

Αν υπήρχαν καθηγητές που δεν μπορούσαν να ανταπεξέλθουν στο ρυθμό του σεμιναρίου;

Αν τους κινητοποίησε να κάνουν πράξη όσα δίδασκονταν;

Το σεμινάριο εισήγαγε τους καθηγητές σε ένα διαφορετικό παιδαγωγικό σύστημα διδασκαλίας. Πώς αντέδρασαν οι καθηγητές σε αυτό;

Είχαν οι καθηγητές ευκαιρίες να εξασκήσουν αυτά που μάθαιναν;

Έχετε παρατηρήσει κάποια συνεργασία μεταξύ των καθηγητών όσον αφορά τους Η/Υ

Κατά τη διάρκεια; Μετά;

Συζητάτε με τους καθηγητές προβλήματα εργασίας; Πότε συμβαίνει αυτό;

Θα θέλατε περισσότερη συνεργασία; Γιατί δεν συμβαίνει τώρα;

Παρακολουθήσατε κάποιο μάθημα με Η/Υ;

Ποιά ήταν η συμπεριφορά των μαθητών;

Νομίζετε ότι μάθαιναν πράγματα;

Η μέθοδος διδασκαλίας ήταν διαφορετική από την παραδοσιακή;

Έκαναν όλοι οι καθηγητές διδασκαλία; Γιατί δεν έκαναν όλοι?

Πώς θα ήταν το ιδανικό περιβάλλον για μάθημα με Η/Υ;

Πόσο διαφορετικό είναι αυτό από την πραγματικότητα?

Ποιές δυσκολίες υπάρχουν τώρα;

Το σχολικό περιβάλλον

Είναι το επίπεδο και η ποιότητα υποστήριξης αρκετή για να αξιοποιήσουν στο μέγιστο αυτά που έμαθαν;

Έχει το σχολείο λογισμικό; Πώς το λάβατε;

Γνωρίζετε το ε- υλικό; Το έχετε χρησιμοποιήσει;

Έχετε ζητήσει από τους καθηγητές να χρησιμοποιούν Η/Υ;

Υπάρχει κάποιο είδος επιβράβευσης για τους καθηγητές;

Τί νομίζετε για αυτό;

Πώς επηρεάζει τη λειτουργία του σχολείου;

Ποιά είναι τα εμπόδια που αντιμετωπίζουν οι καθηγητές όσον αφορά τη διδασκαλία με

ΗΥ και πώς τα ξεπερνάνε;

Γιατί νομίζετε κάποιοι χρησιμοποιούν και κάποιοι όχι; Ως προς τι είναι διαφορετικοί;
Νομίζετε ότι μετά το σεμινάριο θα μπορούσε να ζητηθεί διδασκαλία με Η/Υ υποχρεωτικά;

Στάση απέναντι στους Η/Υ

Νομίζετε ότι οι Η/Υ μπορούν να προσφέρουν στη διδασκαλία;

Ποιά είναι τα πλεονεκτήματα και τα μειονεκτήματα διδασκαλίας με Η/Υ;

Ποιά είναι τα εμπόδια που αντιμετωπίζουν οι καθηγητές για την παραπέρα επιμόρφωση τους στους Η/Υ;

Ποιοί είναι οι κύριοι λόγοι για χρήση Η/Υ με τους μαθητές;

Νομίζετε ότι είναι δυνατό να γίνεται διδασκαλία με Η/Υ και να προχωρεί κ η ύλη ταυτόχρονα;

Τί προσόντα και γνώσεις χρειάζονται οι καθηγητές και τί οι μαθητές;

APPENDIX V

I. QUESTIONS FOR THE TRAINERS IN ENGLISH

Personal details

- Why did you decide to become a trainer?
- Which qualifications that you have supported successfully your application?
- Did you have to teach in schools while working as a trainer?
- How did that influence your training task?
- What kind of training did you receive?
- Was it enough in order to be confident as a trainer?
- Would you like something different?
- Do you use computers?
- For which purposes?

Training

- In how many classes did you teach?
- When was the training happening?
- How did you decide that time?
- Did you know the teachers you were teaching?
- How did that affect the training?
- Did the Labs satisfy the needs of the training?
- Did the Ministry provide you with the content of the training?
- Was the program common for all the classes?
- Did you know the needs of the teachers before the beginning of the training?
- How did you know?
- How did that affect your work?
- Were there teachers who were absolutely inexperienced in IT?
- Were the teachers producing teaching material or they were only attending the theoretical part?
- Did you have to change the program in order to keep up with teachers needs?

Organization

- During the training, did you have contact with other trainers or the people who organized the training?
- What for?
- Did you have contact with the headteachers of the schools where the training was happening?
- With the inspectors of the area?
- For which purpose?
- Did that help your work at all?
- Did you use online training at all?

Was your work monitored in any way?
Did anybody from the Ministry visit you?
Would that be helpful in any way?
How did you deal with technical problems?
Was that consuming too much of your time?
Were there any problems because of that to the flow of the training?
Which were the basic complains of the teachers regarding the training?
Did you have any assistant? For which purposes?
Did you reach your targets at the end of the training?
If no, why not?
Was there any evaluation of teachers' progress at the end?
Did you ever communicate with the teachers after the end of the training?
For which purpose?

School environment

Is the level and quality of support sufficient to enable you to gain maximum benefit from the training and put what you have learnt into practice?
Which were the aims of the training?
Were they met?
Do you know if teachers are using computers now?
What are the difficulties for teachers using computers?
What makes some use and some not use?

About and during the training

Were you discussing with the teachers about the training?
Has the training improved teachers' overall performance? In what ways?
Was the training relevant to their needs as far as it concerns IT skills and subjects' examples?
Were there teachers that could not keep up with the training's pace?
Were the teachers trying out what they have learnt?
Did the training introduced the teachers to a different pedagogy of teaching. How did teachers react to that?
Did the teachers have opportunities to practice what they were learning?
Have you noticed any kind of cooperation among the teachers concerning ICT?
During the training? After the training?
Would you like more cooperation? Why was not happening now?
Did you attend any teaching with computers that the teachers did?
What was pupils' attitude towards the teaching? Do you believe that learning was taking place?
Was the teaching style different from the traditional one?
Did all the teachers do experimental teaching? Why didn't all the teachers do?
How would be the ideal environment for a lesson with computers?
How is that different from the reality?
Are there difficulties now?

School environment

Is the level and quality of support sufficient to enable them to gain maximum benefit from the training and put what they have learnt into practice?

Do the schools have any software available for the different subjects?

How did they get these?

What do you think about the software available?

Do you know e- yliko? What is it about? Do you use it?

Is there any kind of appraisal concerning teachers' efforts?

How do you feel about that?

How does that affect the school's culture?

What are the obstacles teachers are facing in teaching with computers and how do they get over them?

Why do you think some teachers do use computers in their teaching?

In what way are they different from the others?

Do you think teaching with computers could be compulsory, now that they had this training?

Perceptions regarding ICT use

Do you believe that computers can offer to the teaching?

What do you feel are the main advantages of using ICT in teaching?

What do you feel are the main disadvantages of using ICT in teaching?

What are the constraints to teachers' further development of use of ICT in teaching and learning?

What are your reasons for using ICT with your pupils?

Do you think teachers can use ICT and progress with the curriculum at the same time?

What skills and knowledge does the teacher need?

What skills and knowledge do the pupils need?

II. QUESTIONS FOR TRAINERS IN GREEK

Προσωπικές πληροφορίες

Ποιο ήταν το κίνητρο της συμμετοχής σας στο πρόγραμμα ως επιμορφωτή;

Ποια ήταν τα κριτήρια της επιλογής σας ως επιμορφωτή;

Στη διάρκεια του προγράμματος είχατε απαλλαγεί από τα διδακτικά σας καθήκοντα;

Η απαλλαγή αυτή λειτουργούσε θετικά στο έργο σας και γιατί;

Τι είδους εκπαίδευση είχατε λάβει;

Η εκπαίδευση που λάβατε ήταν αρκετή για την ικανοποιητική διεκπεραίωση των προγραμμάτων που σας είχαν ανατεθεί;

Τι θα θέλατε επιπλέον;

Χρησιμοποιείται Η/Υ; Για ποιούς σκοπούς;

Σχετικά με το σεμινάριο

Σε πόσα τμήματα διδάξατε;

Πότε γίνονταν τα σεμινάρια ;

Από ποιόν και πώς επιλέχτηκε αυτός ο χρόνος;

Γνωρίζατε τους καθηγητές τους οποίους διδάσκατε;

Η γνώση αυτή επηρέασε θετικά ή αρνητικά την πρόοδο του επιμορφωτικού προγράμματος;

Τα εργαστήρια όπου έγιναν τα σεμινάρια ικανοποιούσαν τις ανάγκες των προγραμμάτων;

Τι έλειπε;

Τα προγράμματα είχαν δοθεί από το ΥΠΕΠΘ;

Ποιος τα έδωσε;

Τα προγράμματα ήταν κοινά για όλα τα τμήματα στα οποία διδάξατε;

Είχατε γνώση των αναγκών των καθηγητών πριν αρχίσετε τη διδασκαλία;

Πώς αποκτήσατε αυτή τη γνώση ;

Πώς επηρέασε το έργο σας η άγνοια;

Υπήρχαν στα τμήματά σας καθηγητές που στερούνταν τις βασικές δεξιότητες και γνώσεις στη χρήση Η/Υ;

Διδάσκονταν οι καθηγητές παραγωγή υλικού ή απλώς παρακολουθούσαν το θεωρητικό μέρος του προγράμματος;

Χρειάστηκε να τροποποιήσετε το πρόγραμμα και να το προσαρμόσετε στις ανάγκες των καθηγητών;

Οργάνωση

Κατά τη διάρκεια του προγράμματος είχατε επικοινωνία με άλλους επιμορφωτές ή υπεύθυνους του προγράμματος;

Σε τι απέβλεπαν αυτές οι συναντήσεις ;

Είχατε καμιά επικοινωνία με τους

α) Διευθυντές των σχολείων όπου γινόταν η επιμόρφωση,

β) Διευθυντές των σχολείων των οποίων καθηγητές λάμβαναν μέρος στη επιμόρφωση,

γ) Προϊσταμένους των Γραφείων.

Ποιος ήταν ο σκοπός αυτών των συναντήσεων;
Οι παραπάνω σας βοήθησαν και με ποιο τρόπο στο έργο σας ;
Χρησιμοποιήσατε μεικτό σύστημα επιμόρφωσης (face to face, on- line κλ.π.) ή απλό;
Κατά τη διάρκεια του σεμιναρίου επισκέφθηκε το τμήμα σας κάποιος συντονιστής για να ενημερωθεί για την πρόοδο του σεμιναρίου;
Θεωρείτε ότι μια τέτοια επίσκεψη θα ήταν ωφέλιμη και γιατί;
Πώς αντιμετωπίζατε τα τεχνολογικά προβλήματα που συναντήσατε;
Έπαιρνε χρόνο αυτή η αντιμετώπιση ;
Η καθυστέρηση τι προβλήματα δημιουργούσε στο πρόγραμμα;
Τι έχετε να προτείνετε πάνω σ' αυτό το θέμα ;
Ποια ήταν τα πιο βασικά παράπονα των καθηγητών προς εσάς προσωπικά σχετικά με το επιμορφωτικό πρόγραμμα ;
Είχατε βοηθό στη διάρκεια του προγράμματος και για ποιο σκοπό;
Τελικά ολοκληρώσατε το πρόγραμμα ;
Αν δεν το τελειώσατε , για ποιο λόγο;
Μετά το τέλος του προγράμματος έγινε αξιολόγηση του ή της επίδοσης των καθηγητών (παρακολούθηση διδασκαλίας τους κλ.π.);
Μετά το τέλος του προγράμματος είχατε καμιά επικοινωνία με τους επιμορφωμένους καθηγητές;
Ποιος ήταν ο σκοπός αυτής της επικοινωνίας ;
Συζητάγατε το σεμινάριο με τους καθηγητές;
Έχει βελτιώσει την επίδοσή τους;
Ήταν αντίστοιχο των βασικών τους δεξιοτήτων και του αντικειμένου τους;
Υπήρχαν καθηγητές που δεν συμβάδιζαν με το ρυθμό;
Οι καθηγητές έκαναν εξάσκηση αυτών που μάθαιναν;
Τους εισήγαγε σε μια διαφορετική παιδαγωγική διδασκαλίας; Πώς αντέδρασαν;
Είχαν ευκαιρίες να κάνουν πράξη αυτά που μάθαιναν;
Πειραματικές διδασκαλίες έκαναν; Όλοι; Ποιοι;
Είχατε παρατηρήσει συνεργασία μεταξύ των καθηγητών κατά τη διάρκεια και μετά το σεμινάριο;
Θα θέλατε περισσότερη συνεργασία; Γιατί δεν συνεργάζονται τώρα;
Παρακολουθήσατε διδασκαλίες τους;
Ποιές ήταν οι αντιδράσεις των μαθητών;
Ποιό θα ήταν το ιδανικό περιβάλλον για διδασκαλία με Η/Υ;

Σχολικό περιβάλλον

Είναι το επίπεδο και η ποιότητα της υποστήριξης αρκετή ώστε οι καθηγητές να αξιοποιήσουν στο μέγιστο αυτά που έμαθαν;
Ποιό ήταν οι βασικοί σκοποί της επιμόρφωσης;
Επιτεύχθηκαν;
Γνωρίζετε αν οι καθηγητές χρησιμοποιούν υπολογιστές τώρα;
Ποιές δυσκολίες αντιμετωπίζουν;

Τί κάνει κάποιους να χρησιμοποιούν Η/Υ και κάποιους όχι.
Θεωρείτε ότι υπάρχει αρκετό λογισμικό;
Πώς τα σχολεία λαμβάνουν λογισμικό; Είναι καλά εφοδιασμένα;
Γνωρίζετε το ε-υλικό; Ποιά είναι η άποψη σας; Το χρησιμοποιείτε;
Υπάρχει κάποια επιβράβευση για τις προσπάθειες των καθηγητών;
Πώς τους επηρεάζει;
Ποιές δυσκολίες αντιμετωπίζουν οι καθηγητές για τη χρήση Η/Υ?
Μπορούν να τις ξεπεράσουν;
Νομίζετε θα μπορούσε η χρήση Η/Υ να είναι υποχρεωτική μετά το σεμινάριο;

Στάσεις απέναντι στους ΗΥ

Ποιά νομίζετε ότι είναι τα κύρια πλεονεκτήματα και μειονεκτήματα στη χρήση Η/Υ στη διδασκαλία?
Νομίζετε πως γίνεται να χρησιμοποιείτε Η/Υ και να προχωρείτε στην ύλη σας ταυτόχρονα;
Θα επιθυμούσατε παραπέρα επιμόρφωση;
Ποιά είναι τα εμπόδια για την παραπέρα επιμόρφωση σας στους Η/Υ;
Για ποιούς λόγους θα χρησιμοποιούσατε Η/Υ με τους μαθητές σας;
Έχετε ενδείξεις ότι οι μαθητές μπορεί να μαθαίνουν καλύτερα με τη βοήθεια του Η/Υ; Με συγκεκριμένους τρόπους μαθαίνουν περισσότερο από ότι με άλλους;
Ποιές γνώσεις και ικανότητες χρειάζεται ο καθηγητής για να μπορεί να διδάξει με Η/Υ;
Ποιές ο μαθητής;

APPENDIX VI

I. QUESTIONS FOR PROGRAMME DESIGNERS IN ENGLISH

The connection of EE to Odysseia

About the training

Is there any evaluation of EE?

Have you discussed the training with the teachers? Which were their complaints?

What is your impression of the quality of the programme?

Was the curriculum of the programme provided by the Ministry?

Was the curriculum the same for all the programmes and trainers?

Was there any assessment of needs before the start of the programme?

How did that take place?

If there had been no assessment, how did that affect the training?

Were there teachers lacking basic skills?

Were the teachers taught how to plan sessions with ICT or were the sessions purely theoretical?

Did the programme enhance teachers' skills?

Was the programme relevant to teachers' IT and ICT skills?

Was the programme introducing teachers into a different teaching pedagogy? How did they react?

Were the teachers given the opportunity to practice what they were being taught?

What is the ideal environment for teaching with ICT?

Which are the difficulties now in the physical setting?

Which are the criteria of selection for trainers?

Were they released from their teaching duties then? How did this affect the programme?

Was their own training enough for them to address the programme needs?

Was there any communication among the trainers during the programme? What for?

School environment

Is there enough support for teachers to use ICT?

Is there any continuation of the programme?

Which are the barriers to ICT use and how can teachers overcome them?

Why some teachers use ICT and some not?

Do schools have software and where do they find it from?

Could the ICT use be compulsory?

Is there any kind of reward for teachers to use ICT?

How is the school function affected by the existence or not of rewards?

What would you change in the programme?

Perceptions regarding ICT use

Do you think ICT can offer to teaching?

What are the advantages and the disadvantages of ICT use?
What barriers do teachers face towards their CPD?
Can ICT use cover the curriculum needs?
What are the further plans for ICT training?

II. QUESTIONS FOR PROGRAMME DESIGNERS IN GREEK

Το ιστορικό της ΕΕ σε σχέση με την Οδύσσεια. Η σχέση της με το ΚΣΕ.

Σχετικά με τη διεξαγωγή του σεμιναρίου

Έχει γίνει αξιολόγηση του σεμιναρίου;

Έχετε συζητήσει το σεμινάριο με τους καθηγητές; Ποιά ήταν τα πιο βασικά παράπονα των καθηγητών προς εσάς προσωπικά σχετικά με το επιμορφωτικό πρόγραμμα;

Ποια είναι η εκτίμηση σας για την ποιότητα του σεμιναρίου;

Τα προγράμματα είχαν δοθεί από το ΥΠΕΠΘ;

Ποιος τα έδωσε;

Τα προγράμματα ήταν κοινά για όλα τα τμήματα;

Υπήρχε γνώση των αναγκών των καθηγητών πριν αρχίσει τη διδασκαλία;

Πώς αποκτήθηκε αυτή τη γνώση;

Πώς επηρέασε το έργο η άγνοια;

Διδάσκονταν οι καθηγητές παραγωγή υλικού ή απλώς παρακολουθούσαν το θεωρητικό μέρος του προγράμματος;

Γνωρίζετε:

Αν το σεμινάριο έχει βελτιώσει την επίδοση των καθηγητών. Όχι προς τι;

Αν το σεμινάριο ανταποκρινόταν στις ανάγκες των καθηγητών ως προς τις βασικές δεξιότητες και τα παραδείγματα τα σχετικά με το αντικείμενο διδασκαλίας;

Αν υπήρχαν καθηγητές που δεν μπορούσαν να ανταπεξέλθουν στο ρυθμό του σεμιναρίου;

Το σεμινάριο εισήγαγε τους καθηγητές σε ένα διαφορετικό παιδαγωγικό σύστημα διδασκαλίας υπογραμμίζοντας τη συνεργατική μάθηση. Πώς αντέδρασαν οι καθηγητές σε αυτό;

Είχαν οι καθηγητές ευκαιρίες να εξασκήσουν αυτά που μάθαιναν;

Πώς θα ήταν το ιδανικό περιβάλλον για μάθημα με Η/Υ;

Πόσο διαφορετικό είναι αυτό από την πραγματικότητα;

Ποιές δυσκολίες υπάρχουν τώρα;

Ποιά ήταν τα κριτήρια της επιλογής των επιμορφωτή;

Στη διάρκεια του προγράμματος είχαν απαλλαγεί από τα διδακτικά καθήκοντα;

Η απαλλαγή αυτή λειτουργούσε θετικά στο έργο τους και γιατί;

Τι είδους εκπαίδευση είχαν λάβει;

Η εκπαίδευση που ελάβαν ήταν αρκετή για την ικανοποιητική διεκπεραίωση των προγραμμάτων που τους είχαν ανατεθεί;

Κατά τη διάρκεια του προγράμματος υπήρχε επικοινωνία με άλλους επιμορφωτές ή υπεύθυνους του προγράμματος;

Σε τι απέβλεπαν αυτές οι συναντήσεις;

Σχολικό περιβάλλον

Είναι το επίπεδο και η ποιότητα υποστήριξης αρκετή για να αξιοποιήσουν οι καθηγητές στο μέγιστο αυτά που έμαθαν;

Υπάρχει κάποια συνέχεια στην επιμόρφωση αυτών των καθηγητών;
Ποιά είναι τα εμπόδια που αντιμετωπίζουν οι καθηγητές όσον αφορά τη διδασκαλία με Η/Υ και πώς τα ξεπερνάνε;
Γιατί νομίζετε κάποιοι χρησιμοποιούν Η/Υ και κάποιοι όχι; Ως προς τι είναι διαφορετικοί;
Τα σχολεία έχουν λογισμικό; Πώς το λαμβάνουν;
Γνωρίζετε το ε-υλικό;
Μπορεί να επιβληθεί ως υποχρεωτική η χρήση Η/Υ μετά το σεμινάριο;
Υπάρχει κάποιο είδος επιβράβευσης για τους καθηγητές;
Πώς αυτό επηρεάζει τη λειτουργία του σχολείου;
Τι θα αλλάζατε στην επιμόρφωση;

Απόψεις σχετικά με τη χρήση Η/Υ

Νομίζετε ότι οι Η/Υ μπορούν να προσφέρουν στη διδασκαλία;
Ποιά είναι τα πλεονεκτήματα και τα μειονεκτήματα διδασκαλίας με Η/Υ;
Ποιά είναι τα εμπόδια που αντιμετωπίζουν οι καθηγητές για την παραπέρα επιμόρφωση τους στους Η/Υ;
Νομίζετε ότι είναι δυνατό να γίνεται διδασκαλία με Η/Υ και να προχωρεί κ η ύλη ταυτόχρονα;
Τώρα ποιά είναι τα σχέδια για την επιμόρφωση;

APPENDIX VII

INITIAL CODING CATEGORIES

- Compulsory teaching with the use of ICT (**comp**): Possible attitude of teachers to ICT use becoming compulsory (Bold-Underlined).
- Computer use (use19): Interviewees' current use of computers (Lime 19).
- Computers in classrooms (): Comments about the ideal conditions for teaching with ICT (Tan 34).
- Cooperation (coop16): Existence of cooperation among teachers, head-teachers (-Gray 50% 16).
- E- yliko (ylik15): Interviewees' acquaintance with the web site (Blue-Gray 15).
- Evaluation (eval28): Interviewees' perceptions of being evaluated (Sea Green 28).
- Financial management (**fin**): Comments about the financial management of the made by the LEA (Underlined).
- Hands-on activities (hand28): During the training (Bright Green 28).
- KSE and other training projects (kse12): Comments about the good practice of other training programs (Green 12).
- Motivation (mot18): The reasons for which the teachers or trainers participated in the relevant teacher ICT training program (Light Orange 18).
- Pedagogy (***ped***): Comments revealing interviewees' current pedagogy (Bold-Italic-Underlined).
- Personal details (pers25): Any personal information (Pink 25).
- Plans (plan10): Teachers' plans for a future use of the laboratory and ICT use in their lessons (Orange 10).

- Policy (*pol*): Comments about the regulations of the school (Bold-Italic).
- Praise (*prai*): Comments about the existence of formal and informal appraisal or not (Italic).
- Programme (prog21): Any comment concerning the routine of the programme (Aqua 21).
- Reasons (real3): Reasons mentioned for use and no use of ICT in teaching (Teal 13).
- Software (sof23): Comments about the quality, quantity or appropriateness of the existing software (Violet 23).
- Suggestions (sug11): Any suggestions for amelioration and improvement of the training (Dark Yellow 11).
- Support and pressure (sup33): Head-teachers' and LEA's role concerning teachers' use of ICT (Rose 33).
- Teachers' needs (): Comments about the correspondence of the training to teachers' needs (Yellow 27).
- Technical assistance (): Comments about the need or existence of technical assistance (Light Turquoise 37).
- Time for experimenting (tim38): Time for practicing what teachers are taught (Pale Blue 38).
- Time (tim7): Comments of the interviewees on the concept of time concerning the planning of a lesson with ICT (Indigo 7).
- Trial lessons (tri2): Interviewees' impressions from their teaching experience (Brown 2).
- Use of ICT by students (stu5): Interviewees' impressions of pupils use of ICT as they saw it or think of it (Dark Teal 5).

APPENDIX VIII

Extract from Interview with teacher 4

(nee 27)

- When did you attend the other one?
- The year before. So I had already gained the skills. And I only wanted to get informed about the cds that exist for my subjects. I wanted a more specialised information and how to make use (mot 18) of these (kse 12).
- **I think the seminar was pushing you towards a cooperative type of work. How did u react to that? Is it similar to your teaching habits?**
- **I cant say its similar. The subjects that I am teaching are not opt to group working teaching. That's my opinion. I apply the conversational teaching, not the teacher centred; I say and then I ask what I want to receive from the pupils. Me I try to get the knowledge out of the pupils based on what they know. I use group work only for assignments. In task of synthesis I give it to teams of pupils to make the assignment. But in the class I use conversational methods (ped) .**
- During the experimental teaching which was your role as a teacher?
- I had to inform the pupils for the content and the schedule of the program, for the importance of it and its application. After that I left them alone, after I made an exhibition for them how they can use it, I gave them the worksheet, and I left them alone. I was observing the pupils (tri2).
- Did they have problems?
- No all the pupils managed to finish it.
- ...
- Problem ... we ... had to wait for the 3rd ... while ... arranged ... didn't ... Besides that, we are in the difficult position of asking help from the IT teachers. since there is no technical assistance, for installing a software, for making sure that all the teams are working at the same time. While if there was someone constantly to support and help. our life would be easier. I wouldn't have to ask favors from the IT teacher. And be dependent on when it suits him and if he is going to help. There are technical problems about the time, if we need assistance and who will offer it (tech 37).
- Are there pcs in the school in another place?
- Yes there is in the teachers' office and one in the head's office. which we use.
- How do u use the pc? Do u write texts?
- Some texts, some comments that I would like to give to my pupils (use 19).

APPENDIX IX

The initial goal of the EE training programme was to help teachers introduce the ICT into their teaching. Though focusing on ICT it was expected that the programme would support reflection on principles of teaching and learning, indeed trainers were expected to underline the importance of cooperative learning, of the role of the teacher as a mediator to knowledge, of the interdisciplinary approach to teaching and of the acquisition of knowledge by the pupils themselves (Dapontes and Kontakidis, 2001). The trainers were given that general framework according to which they had to plan their lessons.

There was no generic teaching of IT skills, the trainers tried to present the use of ICT in a context which would have relevance for them. This did not happen adequately as seen in the comments by teachers. However it was the trainers' intention to develop basic IT skills in context. In the first sessions, the teacher-trainers were discussing the importance of ICT in education and in teaching the philological lessons in general.

Through document analysis a description of how this was done is given below:

Software example	Context	Comments
The Centennia software	Teaching history with maps	- Teachers were also encouraged to find maps online http://www.clockwk.com/ http://www.ancestry.com/search/rectype/reference/maps/main.asp http://historymedren.about.com/library/weekly/aa071000a.htm . - Example of a teaching with Centennia

Software example	Context	Comments
Attic Literature	Teaching Ancient Greek	- Guidelines for the installation of the software and its pedagogical use - Example of a teaching with Attic Literature
The culture of Mycenae	Teaching History	- Guidelines for the installation of the software and its pedagogical use
21 on board	Teaching history	- Introduction to the use of the software - Activities to get used to the use of the software - Preparing worksheets based on the software
Greek Language Filoglossia	Teaching Greek as a foreign language	- Guidelines for the installation of the software

Application Example	Context	Comments
Word	Preparation of worksheets	- Introduction to worksheets - Typing of worksheets - Example of a worksheet for history
Word	Teaching language Skills	- Example of a scenario for producing a CV. - The use of templates for producing letters and CVs - Worksheets for ways of persuasion in advertising
Excel	Teaching history Excel	- Guidelines for producing chronological timetables and graphs - Creation of a table and a graph showing the losses of the 2 nd World War by nation.
PowerPoint	PowerPoint in teaching Greek	- Guidelines for using PowerPoint - Scenarios for using PowerPoint in Art and History

Website Example	Context	Comments
A list of websites of Museums, archaeological sites and artists.	Teaching art Internet	<ul style="list-style-type: none"> - Examples of teaching art with Internet - Image editing
A list of websites concerning Ancient Greek.	Writing and teaching Ancient Greek.	<ul style="list-style-type: none"> - Websites for writing in Ancient Greek and translating. http://www.perseus.tufts.edu. http://www.komvos.edu.gr. - Scenarios for teaching Ancient Greek
A list of websites concerning Greek Literature	Greek literature online	<ul style="list-style-type: none"> - Finding websites that concern the support of teaching Greek
E-mail	Teaching Modern Greek	List of activities from language skills improvement through e-mail

APPENDIX X

	Comments on Preparation	Comments on the Use of ICT	Comments on the lesson
Teacher 2	Number of technical difficulties Difficulty in choosing the site, because it had to be in Greek.	Pupils worked through worksheets by themselves. Task: Pupils had to design the marbles of Parthenon.	It was positive experience. Not too different from traditional teaching.
Teacher 3	The trainer needed to be present.	Access to prepared online sources online.	The kids can learn but not as a one off. The ideal environment is a combination of traditional teaching and a computer for each kid
Teacher 4	5-6 hours of preparation needed.	Software with 'restricted number of questions of the form, true or false. There was no deeper analysis on the content. It was mostly for vocabulary or grammar'.	Exciting experience for teacher and for the pupils. It takes lots of time. One-two hours to introduce the subject and then dedicate another one in the computer suite. The lesson in the class cannot be substituted with the lesson in the lab.
Teacher 6	3 weeks of preparation for the 2 lessons.	Search in newspapers and news agencies online. Pupils had to access information based on the worksheet provided	Pupils did not learn new things and they saw another way of dealing with the book material. Teaching method was not different. The tool was different.
Teacher 7		Search provided sources.	Very positive. Pupils liked it and they participated more. It was something different for pupils and teachers. It motivates the pupil while in class s/he is passive and he is waiting for everything. There were some pupils who didn't know how to use computers but they were separated in groups.

	Comments on Preparation	Comments on the Use of ICT	Comments on the lesson
Teacher 8		<p>A CD-Rom in History.</p> <p>Groups were planned and pupils were given roles; the chief, the secretary and so on.</p> <p>Search for sources, note-taking of the most important issues and conclusions.</p>	<p>Escape from the everyday routine. It is absolutely different procedure.</p> <p>Pupils were researching alone through the computer.</p> <p>The role of that lesson was additional; additional knowledge to that of the book.</p> <p>ICT is used as a tool in parallel with other tools as maps and the blackboard.</p> <p>The role of the teacher important to animate what is presented on the computer in a flat way.</p>
Teacher 12		<p>CD-Rom in History.</p>	<p>Lack of experience can make the classroom slip away.</p>
Teacher 16	<p>2 hours in the computer suite with 8 pupils who volunteered:</p> <p>'I only took in there 8 kids. With the rest, I could not even co-operate. I told the kids that it was not necessary for them to be present and that they wouldn't be punished, so only 8 kids came. And I co-operated with them. The rest were saying, we are bored, we don't want....'</p>	<p>Presentation at the computer of a project about Kavafi and his texts. 2 poems were given for comparison.</p>	<p>The pupils showed great excitement, even the 'bad' pupils.</p>
Teacher 17	<p>It demands time and I think that the results are not equivalent, maybe because it is the beginning and we don't have the experience. Maybe because at the beginning I couldn't even write in word.</p>	<p>Search on sources online while provided with a worksheet.</p>	<p>Many things that are not available in the books.</p> <p>It was a very positive experience for pupils and the teacher.</p> <p>Less tiring than traditional teaching because the teacher deals with pupils individually.</p>