TEACHERS IN THE ERA OF ACCELERATION

How the acceleration of ICT developments influences the ICT use by teachers at school

Georgios Charalambous
June 2015

Linköping University
Department of Behavioural Sciences and Learning
International Master Program Adult Learning and Global Change
Table of contents

1. Introduction ............................................................................................................. 6
   1.1. Overview of this study ....................................................................................... 6
   1.2. The context ....................................................................................................... 7
   1.3. Aim and research questions ............................................................................. 8
2. Literature review ...................................................................................................... 9
   2.1. Factors affecting the teachers’ use of ICT in the classroom ......................... 9
   2.2. Teachers as lifelong learners .......................................................................... 10
   2.3. The ICT acceleration .................................................................................... 11
3. Theoretical concepts ............................................................................................... 14
   3.1. The Social Acceleration theory ...................................................................... 14
   3.2. Lifelong Learning as a fundamental concept for teachers .......................... 15
4. Methodology and methods ..................................................................................... 17
5. Findings .................................................................................................................. 21
   5.1. General findings .............................................................................................. 21
   5.2. Perception of ICT acceleration ...................................................................... 22
   5.3. Social change .................................................................................................. 22
   5.4. Experienced increase in the pace of life ......................................................... 23
   5.5. Effects of Acceleration of ICT in the use of ICT by teachers .................... 24
   5.6. Relation to lifelong learning ............................................................................. 25
   5.7. The official side (interview with the director) ............................................... 26
6. Discussion ................................................................................................................. 28
   6.1. How teachers perceive the ICT acceleration ................................................ 28
   6.2. The effect of the acceleration of social change on the ICT use by .......... 29
   6.3. The increase of the pace of life and its meaning for the teachers .......... 29
   6.4. Effects of the acceleration of ICT on the use of ICT by teachers ........... 30
   6.5. How teachers’ lifelong learning is affected ................................................. 31
   6.6. The official side ............................................................................................... 31
7. Implications and conclusion ................................................................................... 33
   7.1. Limitations and further research ................................................................... 35
APPENDIX I ............................................................................................................... 38
APPENDIX II ............................................................................................................. 39
References ...................................................................................................................... 40

Table of tables
Table 1 ....................................................................................................................... 18
Table 2 ....................................................................................................................... 19
ABSTRACT

In the effort to examine the factors that impact the use of ICT by teachers, research has up until now neglected the acceleration of ICT developments as a factor that affects the successful integration of ICT in education. The technological acceleration in general has triggered significant changes at the social level, such as the acceleration of social change and the acceleration of the pace of life. This is why the study of the acceleration of ICT provides for a good theoretical framework to study the teachers and their interaction with ICT in a broader context, one that engages the environment in which a teacher functions as a teacher and a learner. This study explores the role of the acceleration of ICT as a factor that affects the use of ICT by teachers in Cyprus secondary schools. The Social Acceleration (SA) theory is used to interpret the whole situation. After examining how teachers perceive the ICT acceleration, how it affects them at school and personally as lifelong learners the results showed that ICT acceleration is not a significant factor in the use of ICT by teachers at schools in Cyprus but it still affects teachers indirectly as lifelong learners. I argue that the teachers have established a superficial relation to technology that has to do with a short-sighted vision of ICT integration which also the Ministry of Education shares. I propose that serious decisions should be made at a policy level in order to make a conscious adoption of technology, not necessarily running behind the accelerated ICT developments but exploiting the potential of ICT according to the needs of the educational system.

Keywords
ACKNOWLEDGEMENTS

I would like to thank many people without the help of whom this study could not be realized. First of all I would like to thank the University of Linköping, Sweden which accepted me in the ALGC Master degree program giving me an invaluable opportunity to refresh my education. I would more particularly like to thank Song-ee who directed the program and was always so helpful; Miriam from the Monash University who was so inspiring in her course; Deo from the UBC who was so patient and encouraging with me when I needed it, and Zelta from the Western Cape University for showing me a new way to see the global reality. I owe a special thanks to my supervisor Anna Lundin for her eager, exact, and so polite remarks during this project. A big thank goes of course to all tutors during these two years and all classmates for our cooperation but especially to Victoria Anderson who reviewed the whole work and helped me to fix many details.

Finally I thank my wife Maria for her patience during the long hours of my study and my children Vasiliki, Konstantinos, Silouanos and Magdalini who inspired me with their smiles and humor.
### ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT</td>
<td>Information and Communication Technologies</td>
</tr>
<tr>
<td>ECDL</td>
<td>European Computer Driving License</td>
</tr>
<tr>
<td>SA</td>
<td>Social Acceleration</td>
</tr>
</tbody>
</table>
1. Introduction

1.1 Overview of this study

Technology, and especially Information and Communication Technology (ICT), affects all aspects of our life and the need to exploit its potential in education is undisputable. Over the last decades many studies have been conducted in order to investigate the impact of ICT on the quality of education. Still the research results are sometimes contradictory or at the best inconsistent. For example Wood (2010) holds that ICT use at school can improve the pupils’ educational achievements while the research of Albaaly & Higgins (2011) reveals that there is not a strong relationship between ICT use and pupil attainment. Furthermore other researchers suggest that ICT improves pupil motivation (Papastergiou, 2009) while there are also studies which show that the use of sophisticated and exciting tools might as well distract students from learning (Schmid, 2008).

Overall, we can say that there are two main lines in the results of the research regarding the relation of ICT and education: a) there are the studies which conclude that ICT enhanced the quality of education and that technology has a pragmatic impact on attainment in teaching and learning (Harrison, et al., 2002) b) there are researchers who believe that our expectations form ICT has been over-optimistic about the advantages that it can bring to education, and in reality “ICT has supported and enhanced practice but has failed to transform education” (Munro, 2010, p. 46). In all cases the international research continues to investigate the possible positive or negative contribution of various factors to the successful integration if ICT into education.

One factor that is considered decisive when investigating the relation between ICT and education is the role of the teacher. Tetla (2012) shows that the successful integration of ICT in teaching and learning is essentially determined by teachers’ acceptance and embrace of ICT. Aktaruzzaman, Shamim and Clement (2011) maintain that teacher ICT competency is central to successful application of ICT in the teaching and learning environment. Yet, teachers as adult learners with the need to learn for professional and personal development have not always accepted technology with enthusiasm. Therefore researching the relation of teachers to ICT is of crucial importance when we consider the need to integrate technology into education.

Working in this direction, this study is an attempt to better understand the acceleration of ICT developments as a factor affecting the ICT use by teachers at school and its consequent effects in the integration of ICT into education. The study focuses on a small group of teachers in the secondary schools in Cyprus.
This research can have a substantial impact on designing the professional development of the teachers, and will help to formulate pragmatic expectations when we demand that a teacher becomes a lifelong learner based on the opportunities that technology provides. This study can also help in setting realistic goals when we envision the integration of technology into education as it seems that the speed with which technology proceeds has nothing to do with the rhythm that education can assimilate the changes which technology brings.

1.2 The context

In Cyprus after the six years of primary education there is the gymnasium (3 years) and then the lyceum (3 years) (MOEC, 2001). Since 1986 computers were introduced in all lyceums as a separate lesson which meant the creation of one computer lab in every lyceum (MOEC, 2001). Later, in 2002 the computer lesson was also introduced in gymnasiums as a compulsory lesson which led to the creation of one computer lab in every gymnasium (MOEC, 2004). As of 2002 there is an extra multimedia classroom in every lyceum and in most gymnasiums which can be used by the teachers of history and foreign languages but the use of this lab is not compulsory for the teacher. All schools have Internet connection in the above mentioned labs (MOEC, 2004). Unfortunately the training of the teachers was delayed very much because of problems between the Union of the teachers and the Ministry of Education. It was only in 2005 that the training started (Karagiorgi and Symeou, 2007). All teachers went through a series of seminars on basic computer use (Windows and the use of MS Office). At the end of the seminars they could sit the European Computer Driving License (ECDL) set of seven exams although it was not obligatory. After that training, each specialization (Mathematics, Philology, Chemistry etc) would be responsible for advancing the use of ICT in their subject under the direction of the respective Ministry inspectors.

Today teachers do an administrative use of ICT (to see the program of the school for the current month, to respond to Ministry requests, to be informed about changes in the educational context of Cyprus, to report pupils problems and to create a report for their activity during the school year). Regarding the educational part though, everything was practically left on the initiative of the individual teacher and the Ministry, through the inspectors of every lesson, asks that the teachers “make use of technology” in their lessons without providing much support and without pressing. At the same time, during these last 30 years, since when computers were introduced in the Cyprus education system, the industry of ICT has seen innumerous and above all spectacular developments. Given this fact, the use of ICT in Cyprus schools seems to be very poor and has never brought any
substantial changes in our education as expected. Developing a deeper understanding of this situation is therefore crucial for future educational design and this study is an attempt to this direction.

1.3 Aim and research questions

ICT is today considered an important tool for the teacher but the hardware and software industry produce new equipment and new versions of software all too often. The rhythm by which all these ICT developments are made available in the market is indeed an accelerated one. Teachers and the school often find themselves in front of bigger or smaller changes in hardware and software that impose a need for continuous learning. The aim of this study is to examine the acceleration of ICT developments as a factor affecting the ICT use by teachers at school and of course examine the consequent effects in the integration of ICT into education. The secondary education in Cyprus will be the context of this research. More specifically the following questions will be examined:

- How teachers perceive the ICT acceleration in their professional life.
- If and how the ICT acceleration affects the ICT use by teachers at school.
- If and how the ICT acceleration affects teachers’ learning for professional purposes in the lifelong learning sense.
2 Literature review

Literature on ICT integration into the Cyprus education is scarce. I will thus consider that the typical international academic research on the matter covers also the case of Cyprus teachers.

2.1 Factors affecting the teachers’ use of ICT in the classroom

Teachers’ beliefs are especially important when considering the ICT by teachers at school, showing how important the individual is when coming to applying educational policies. Mama and Hennesy (2013) developed a typology of teachers’ beliefs about ICT and connected these beliefs with the ICT use that teachers make in the classroom. In their study Mama and Hennessy conclude that the perceptions of ICT that teachers have, fall into one of four categories namely the diversifying, the powerful, the convenient, and the subversive” (Mama & Henessy, 2013, p.386). These perceptions are directly connected to four respective teachers’ practices while using ICT in the classroom: use is directly related to the lesson objectives changing pedagogy, use enhances existing practice, use is occasional and managerial, and Use is purposefully avoided. As it is made obvious here the teachers’ beliefs about technology is a strong predictor for the kind of use that teachers actually do in the classroom.

Other researchers investigated especially the factors that affect negatively the teachers’ use of ICT in the classroom. For example a number of possible factors/barriers that prevent the anticipated transformation in education have been found including factors that have to do with the equipment needed as e.g. the unavailability or inappropriateness of technological equipment in schools and the lack of ongoing technical support (Bingimlas, 2009; Inan & Lowther, 2010). There are also more general reasons as e.g. problematic communication of the policy to school leaders and negative school culture on the innovation (Inan & Lowther, 2010). The factor of training proves to be very important and thus teachers’ lack of technological knowledge and skills and insufficiency of ICT training programmes is always present in the research results (Bingimlas, 2009; Inan & Lowther, 2010). The lack of time and the teachers’ beliefs about ICT, especially in terms of their compatibility with their teaching philosophy are two most important factors/barriers in the integration of ICT into education (Mama & Henessy, 2013; Bingimlas, 2009).

Obviously the relation of ICT and teachers is a complex one and comprises factors of a certain diversity. This is reaffirmed by Mathipa & Mukhari (2014) who examined the factors that relate especially to teachers from a Network Society theory perspective. According to this study, factors
that prevent the successful ICT integration into teaching and learning are insufficient number of computers and lack of application programs, teacher generation gap, inadequate teacher training, lack of ICT skill and lack of confidence and teachers’ beliefs. Noticeably a big number of different factors are found to affect the productive use of ICT by teachers whatever the framework of examination of this problematic situation.

Some researchers reveal especially the relationship between the digital competence of teachers and the use of ICT that they make. ICT tools are most of the times sophisticated tools that require knowledge and experience from the side of the user and this requires in turn many hours of training and practice. Moreover as it was shown by Fredriksson et al. (2008) and also by Valiente (2010) participation in professional development activities, aimed at developing teachers’ digital competence can significantly influence teachers’ use of ICT. Obviously more experience in the use of ICT tools encourages the teacher to incorporate such tools in his everyday work. It even seems that training has to be continued well after the initial introductory courses that teachers are expected to attend. More particularly, recent research results within the European context reveals that, regarding the digital competences, “participating in basic training is not enough to bring about an increase in teachers’ use of ICT” (European Commision, 2013, p.15). The study showed that rather more advanced ICT related professional development is more likely to encourage technology enhanced learning in the classroom. Interestingly enough this study also finds that “there is a closer relationship between pedagogically oriented, compared to equipment specific training, and teachers’ use of ICT based activities.” (European Commision, 2013, p.15). Therefore in this study the appropriate level of training (advanced as opposed to basic) and the type of training (pedagogically oriented as opposed to technically oriented training) are clarified.

2.2 Teachers as lifelong learners

This need of continuous professional development for the teachers and especially the need to acquire advanced digital competences in parallel with the ICT pedagogic use, presupposes a teacher who learns continually because of the continuous change in the field of ICT. Even in a country like Finland where technology is integrated in education at an exceptionally high degree (Tirri, 2014), the need for continuous updating of the ICT knowledge of teachers is explicitly denoted by Tirri (2014) when saying “teachers [in Finland] need to master the rapidly changing developments in information and communication technology in order to function in the same learning environments as their students” (Tirri, 2014, p.600). Therefore given the continuous change in the field of ICT the
The notion of lifelong learning is indeed relevant and most important when it comes to a teacher’s professional development and his general relation to ICT.

The factor of time seems to worthwhile special focus as we study the relation of teachers and ICT in the lifelong learning sense. Time has two interrelated dimensions. On the one hand, time refers to familiarity: teachers need time to learn the technology: time to learn new skills, time to find out about technologies, time to find out about resources, plan, and try out new approaches to teaching and learning, time to reflect upon experiences and consolidate learning, time to share those experiences with others (Karasavvidis, 2009). On the other hand, time refers to the feasibility of ICT introduction: teachers are concerned that given the circumstances they might be unable to incorporate ICT into their daily practices according to the much celebrated popular ICT rhetoric (Karasavvidis, 2009). Furthermore, the ICT competences of teachers seen as a lifelong process make the problematic relation between time and lifelong learning to surface yet another time. The question of the scarcity of time at an era of increased complexity and its importance in lifelong learning is brought forward by Alhadeff-Jones (2010). As ICT developments impose lifelong learning to teachers for work and personal life the analysis of the time factor in adult learning from a critical perspective makes the contribution of Alhadeff-Jones (2010) an important one.

Finally in a more philosophical study, Laferrière, Hamel & Searson (2013) tried to go beyond the mere identification of barriers to successful integration of ICT in educational settings, by analyzing this situation from an activity theory framework. They interestingly concluded that “the activity theory explains that the overcoming of barriers is an ongoing exercise as some tensions get resolved, reappear or give way to new ones” (Laferrière, Hamel & Searson, 2013, p.463) Obviously, what we call integration of technology into education is not a one-off event but rather an unceasing process which will continuously bring new barriers to be faced.

2.3 The ICT acceleration
Although the origin of the acceleration of technology can be traced back to the 19th century, the sector of education is today mostly affected by the ICT developments and not the whole of technology and this is why I will only consider here the acceleration in the ICT. Acceleration, in the means of new products and ideas appearing more and more often has been one of the main features of technological development throughout the history of technology (Rosa, 2013). Nevertheless, it was, during the last century that acceleration made its presence really apparent and especially so in the ICT sector. More specifically, ICT acceleration started around 1940 and occurred mainly in hardware. The characteristic of this period is that for a change to
happen it took time to find the new methods of construction/manufacturing e.g. new ways to manufacture more transistors per q.cm. Even this however, had to face the physical limits of the materials so the Moore law was formed which is actually based on hardware. Advancing in this mode, the progress in the technology of microprocessor has been significant and in all manners accelerating at least until 2000 (Pillai, 2013). From then on there is a decline in the speed of the sector because “further innovation in the semiconductor equipment industry is becoming ever more difficult as the industry approaches the physical limit to reducing the size of the transistor” (Pillai, 2013, p.906). But from the invention of Internet as we know it today, and especially after 2000, the developments came mainly in software which actually meant development of ideas. Fichman, Santos and Zheng (2014) note that during the last 50 years “we have witnessed the creation of a relatively cheap and increasingly easy-to-use world-wide digital infrastructure of computers, mobile devices, broadband network connections, and advanced application platforms” (Fichman, Santos & Zheng, 2014, p.2). It is interesting how this line of change starts with computers, continues with networks but ends up with “advanced application platforms” which means the software implementation of ideas that thrive on the Internet. This is obvious in the Internet history where we had the Web 1.0 (1993-2000) used mainly for providing information, Web 2.0 (2000-2015) where the Internet was used in a social manner (podcasts, blogs, video sharing and social networks) and Web 3.0 (semantics and Internet of things) which is coming. This fact created a very rapid change because the actual “new” was entering the market as ideas/software/environment of use and not as hardware, this meaning that the implementation was always based on a ready and functioning Internet.

Fichman, Santos and Zheng (2014) hold that this global digital infrastructure has accelerated the emergence of new technologies that enable serious transformations in the way we live and work. It follows that education is indeed a sector that is affected. In the pace of this acceleration of provision of new technologies, education adopted ICT but unfortunately “with schools proving slower to change their lesson plans than they were to fit computers in the classroom” (Livingstone, 2012, p.9). Obviously the adoption of education has been in many cases acritical and did not always trigger deeper changes that affect the classroom practices. Therefore the acceleration of ICT is highly relevant in this study not only for the potential transformations that new technologies bring but also for their hasty adoption into education which leaves little space for study and thought about the possible implications.

As it is shown by the above literature review, the research so far assures us for two things: a) there is a good number of factors affecting the ICT use by teachers and b) the effort of a teacher to learn
and use the ICT in his job should be a continuous one and indeed part of a lifelong learning effort. Nevertheless, one can easily see a gap in the research done so far because, while the very subject of discussion is technology and its use by teachers, the acceleration of technological developments i.e. the rhythm with which ICT and its possibilities is offered to teachers has indeed been neglected as a factor that impacts the integration of ICT in education. The acceleration of technological developments is directly connected to the time factor we have seen above and possibly other factors. It is moreover connected to lifelong learning, the latter being essentially a temporal process. As the acceleration of technology triggers significant change in the social level, its study provides for a framework to better understand the teachers’ interaction with ICT in a broader context, one that engages the environment in which a teacher functions as a teacher and a learner.
3 Theoretical concepts

3.1 The Social Acceleration Theory

This study will try to use mainly the Social Acceleration (SA) theory to interpret the whole situation. The Social Acceleration theory is a social theory in the critical tradition and it was developed by Hartmut Rosa, sociologist and philosopher, professor of sociology at the University of Jena, Germany. Rosa draws mainly upon the work of Bauman, Castells, Honneth, Virilio, Sennett, Ehrenberg and Luhmann and develops a new theory of modernity which rigorously systematizes the temporal theme which has been present in western Marxism since Marx. Rosa suggests that it is the time and its acceleration that permit to understand the dynamics of the modernity therefore we should reread the modern history under the light of the acceleration forces and not the forces of production as proposed by Marx.

Rosa systematizes social acceleration by breaking it into three fundamental processes: technological acceleration, the acceleration of social change, and the acceleration of the pace of life.

Technological acceleration can be defined as ‘the intentional speeding-up of goal-directed processes of transport, communication, and production’ (Rosa, 2013, p.74). Technological acceleration also includes new accelerative forms of organization and administration. Rosa says that these processes are driven, above all, by ‘the economic logic of capitalism’ (Rosa, 2005, p. 448). The acceleration of social change is what Rosa terms the “contraction of the present” (Rosa, 2013, p.76) in the sense that it shrinks the period of time in which action-orienting experiences and expectations matter. Drawing on Luhmann’s theory of temporalization, Rosa notes: “In a society . . . structured along the lines of functional ‘systems’, like politics, science, art, the economy, law, etc., complexity increases immensely. As a result, the future opens up to almost unlimited contingency, and society experiences time in the form of perpetual change and acceleration” (Rosa, 2003, p.14). The acceleration is expressed through the contraction of the present moment and is defined by an increase in the decay-rates of the reliability of experiences and expectations (Rosa, 2013, p.76). Social beliefs and actions have a shorter and shorter period of validity and are frequently contemporaneous with other beliefs and actions with which they are radically inconsistent. This accelerator is reflected in cultural knowledge, social institutions, and personal relationships. The acceleration in the pace of life is the third accelerator and it is “the heightening of the tempo of life, understood as an increase in episodes of action or experience per unit of time” (Rosa, 2013, p.78). It happens despite the expectation that technological change should increase an individual's free time. The acceleration in the pace of life is expressed in modern societies as a continuous feeling of lack.
of time. The three aspects of social acceleration are interdependent although the technological acceleration predominates as a cause of the other two.

All three aspects of acceleration are relevant to the work and everyday life of the teachers and I have selected this theory to serve as the basis of my analysis exactly because it permits me to examine the teachers in a wider social context where they not only function as teachers but as learners as well. More particularly, the technological acceleration is mostly relevant as more technologies are produced, more often, thus more technologies enter the life of the teachers at the professional level. Furthermore the acceleration of social changes means that the social beliefs and actions have a shorter and shorter period of validity. Practically this takes the form of a contraction of the time horizon of the individual. A person can hardly envision a job for a lifetime, the changes in one’s job can happen more often and be radical, and the knowledge acquired today will very soon need updating. These characteristics of the modern life, as described by the SA theory, can directly impact the teachers as professionals. Finally the acceleration in the pace of life is imposed by technology to a large extent and can be connected to teachers as they are asked to learn more things at an increased pace creating the feeling of scarcity of time. This constant feeling of lack of time can also affect the effort of a teacher as a lifelong learner. Therefore the framework set by the “Social acceleration” theory will be used to better understand the teachers’ experiences in the new educational environment where ICT plays an increasingly important role.

3.2 Lifelong Learning as a fundamental concept for teachers

The notion of “lifelong learning” came as a successor of the term lifelong education. And while this latter expression imagined a life-long and life-wide education which would enlighten the humans, lifelong learning came as an impoverished version of that views to mean in most of the cases “a pragmatic response to immediately understandable learning needs” (Bagnall, 2009, p.278). Additionally –and of course unfortunately- the interpretation of the term learning needs are determined by the interests of the more politically and economically powerful sectors of society as Bagnall (2009) put it. But even in this narrow definition of lifelong learning which limits its scope into the professional development, lifelong learning and teachers’ professional development go together. OECD stresses for example that there is a growing recognition of the need for teacher education policies to embrace the concept of lifelong learning and to acknowledge teachers’ needs at every stage in the teaching career (OECD, 2005). This implies that given the long period which this kind of learning has as scope, -which is actually a whole life- a long-term strategy is needed to face the changing needs at the various stages of a career and life in general. Kellaghan (2009) even
insists that lifelong learning should be included in the initial teacher education as he identifies several factors that bind together lifelong learning and teacher education as, for example, “an appreciation that learning is life-long; that we live in, and pupils have to be prepared for, a ‘knowledge economy’; that Information and Communication Technologies have a contribution to make in developing the kind of knowledge and skills that will be required in the future” (Kellaghan, 2009, p.15). As we can see, a contemporary teacher needs to make learning a life goal for himself but at the same time he has a responsibility for preparing his students for the modern world. As the pupils of today will be working in the knowledge economy, a teacher should be familiar with the latest technologies in order to offer relevant education to his students.

On another issue, the ICT developments constitute a main positive factor for the creation of knowledge but most importantly for the diffusion of it (Nour, 2010). Obviously then knowledge in all fields is today produced and circulated constantly thus what one learned in the University in order to become a teacher is never enough and needs a constant updating. The ICT plays here an important role. The ICT tools more than being today an essential part of the job of the teacher (as teaching and administrative tool), they are the means to acquire the new knowledge that is constantly produced in the contemporary society. Learning throughout a life, is therefore depended on ICT and the notion of lifelong learning naturally swirls with the rhythm by which technology advances. This is why it is of vital importance to consider lifelong learning when studying the relation of teachers to ICT. Lifelong learning is relevant in a study of the acceleration of ICT as a factor in ICT use by teachers for a second reason: Lifelong learning is essentially a time process: it is deployed over a large period of time and a good amount of time in needed in the everyday life to perform it. But time is today a scarce commodity and the technological acceleration has a serious contribution to this phenomenon as the SA theory explained above supports.
4 **Methodology and methods**

As this study examines the impact of a certain factor, namely the acceleration of ICT developments, on the ICT use that teachers do at school, it is important that I search for the reality as experienced by the teachers in learning and using technology at work. Relying on quantitative reports which usually show more computers and faster Internet at schools can be insufficient and can lead to wrong conclusions. As put by McMillan and Weyers (2010) “The information obtained [through qualitative research] is potentially richer and deeper than that described in numbers and statistics, and can take advantage of the many subtle ways of using language to express opinions, experiences and feelings” (p. 125). For example, in a recent research concerning all the countries of the European Union (European Commision, 2013) the governmental investment in technological infrastructure at schools appears to continue at a high level. Nevertheless the study assures us that “no overall relationship was found between high levels of infrastructure provision and student and teacher use” (European Commision, 2013, p.9). The lived experience therefore can only be found with a qualitative research because, as put by Gillham (2000), “[qualitative research will enable you] to get under the skin of a group or organization to find out what really happens” (Gillham, 2000, p.11). So the qualitative approach will enable me to investigate the informal reality which can only be perceived from the inside. Either way we live in an era that ICT is generally considered by many the panacea for the problems of education and its adoption without critique jeopardizes the whole effort. It is essential then that with a qualitative research we search for the meaning of the attempted - through the ICT - transformation of education, a meaning as it is constructed by the teachers. According to Cooper and White (2012) “qualitative research considers reality not as a fixed, objective, and constant construct but as a more fluid, ephemeral, and ever-changing thing” (Cooper and White, 2012, p.29). Such features of the qualitative approach in research match perfectly with the continuous change of technology (and indeed the change in the rhythm of change i.e. its acceleration). It is essential therefore to search for an interpretation of the research results at a particular point in time and in a particular context so that we understand the meaning that teachers construct of all the changes that ICT has brought into their professional life. Otherwise we will continue to observe a gap between the expected results of policies and the reality.

The method of data collection was that of semi-structured interviews so that the participants would have the opportunity to expand on certain issues and narrate their personal experiences. This approach also provided a flexible style suited to the personality and circumstances of the interviewee, and permitted the researcher to analyze and expand informants’ responses (Hitchcock & Hughes, 1989). That was essential for the collection of data in this study as the attitudes towards
technology differ between teachers and presenting these attitudes was for some teachers a sensitive matter. Interviews lasted between half and one hour and focused on general acceleration in modern life, acceleration in professional life, professional development in Cyprus schools, ICT use in classroom, ICT at school for administrative purposes, opportunities for lifelong learning and ICT as a tool in lifelong learning (see APPENDIX II).

Regarding the selection of the participants, the findings of Mama and Henessy (2013) affected my choosing of the teachers. Mama and Henessy (2013) proved that there are four categories of teachers according to their beliefs about technology and its role in learning. More specifically, as we saw in the literature review, there are “four distinguished tendencies with perceptions of technology as a diversifying, powerful, convenient or subversive tool” (Mama & Henessy, 2013, p.386). In the table 1 below I have summarized the relation between these perceptions of technology and the teachers’ classroom practices as presented by Mama and Henessy (2013).

<table>
<thead>
<tr>
<th>Group</th>
<th>Perception of technology as</th>
<th>Classroom practice</th>
<th>Description of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diversifying</td>
<td>integrational</td>
<td>Use is directly related to the lesson objectives changing pedagogy</td>
</tr>
<tr>
<td>2</td>
<td>Powerful</td>
<td>incremental</td>
<td>Use enhances existing practice</td>
</tr>
<tr>
<td>3</td>
<td>Convenient</td>
<td>incidental</td>
<td>Use is occasional and managerial</td>
</tr>
<tr>
<td>4</td>
<td>Subversive</td>
<td>inimical</td>
<td>Use is purposefully avoided</td>
</tr>
</tbody>
</table>

In order to choose the right participants I asked a number of teachers to answer a small survey (APPENDIX I) which could reveal in which one of the four above categories they belong. I finally managed to find two teachers from each category so that my sample of teachers is balanced as to how they see and use technology. There are also two main categories of teachers depending on age: those who met technology in the University or after it (>45 year olds) and those who met technology in their youth. In this study I will interview teachers older than 45 as they are the largest part in Cyprus secondary schools now. There is finally the male/female and subject of teaching categorization; in the study four women and four men took part.
All the teachers in my study were full-time permanent-position teachers of public secondary schools in Cyprus. More particularly they were teachers of the 1st and 2nd Lyceum of Paphos, Cyprus. My sample consists of eight teachers older than 45, four male and four female who teach different subjects. Teachers of Informatics were excluded as they are expected to follow the changes of technology by profession while this is not expected for all other teachers. The teacher’s data are summarized in Table 2.

Table 2

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Gender</th>
<th>Subject</th>
<th>Years of working in a public school</th>
<th>Category according to Mamma and Henessy (Table 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Male</td>
<td>History</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>T2</td>
<td>Male</td>
<td>Mathematics</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>T3</td>
<td>Female</td>
<td>Physics</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>T4</td>
<td>Male</td>
<td>Design and Technology</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>T5</td>
<td>Male</td>
<td>English</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>T6</td>
<td>Female</td>
<td>Greek Language</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>T7</td>
<td>Female</td>
<td>Greek Language</td>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>T8</td>
<td>Female</td>
<td>Chemistry</td>
<td>18</td>
<td>4</td>
</tr>
</tbody>
</table>

An interview was arranged with each teacher independently at a place convenient to them. I also interviewed the director of a school to learn about the official policies regarding the integration of ICT into Cyprus education.

The interviews were recorded and transcribed. Coding followed and categories emerged from the analysis of the interview data with the eight participants. The categories are discussed in the following sections and placed in relation with the literature. The axis of interpretation is the Social Acceleration theory and the concept of lifelong learning from a critical perspective.

A parameter that could possibly affect data collection and of course interpretation is that I am personally a teacher of ICT and I have been working with teachers’ training for years. In qualitative studies the researcher is considered an instrument of data collection (Denzin & Lincoln. 2003). This means that data are mediated through this human instrument, rather than through inventories,
questionnaires, or machines. According to Greenbank (2003) the qualitative researcher needs to describe relevant aspects of self, including any biases and assumptions, any expectations, and experiences to qualify his or her ability to conduct the research (Greenbank, 2003). In my case a positive thing is that I do not work in the government schools but I am self-employed. Therefore possible biases become much less important in my research as I do not try to prove that either the Government or the teachers is the right side. On the contrary I have made every possible effort not to push the conversation towards any certain point when interviewing the teachers. The other positive factor was that, as I do not work in the Government schools, the teachers were not afraid of expressing the real situation; rather they were content that someone from outside of the system could accept their position and understand it.

As far as ethical problems are concerned three parameters were taken into account: the harm and benefits it may bring to participants; informed consent and guarantees of privacy and confidentiality (Mason, 1996; Miles & Huberman, 1994). I as a researcher knew most of the interviewees, and I reassured them that the ultimate purpose of the research is for both parties to get useful feedback. Hence, there was no danger of deception to the participants and teachers could benefit from a study that intended to find the real problems in integrating ICT into education. Such a study could help the Ministry of Education to give more pragmatic solutions to the problem and their Union to have a better understanding of the realities when they proposed possible solutions to the Ministry. Furthermore, informed consent had to be ensured. Participants were informed well in advance about the aims of the research, purpose and format of the interviews, issues discussed, recording, time and place. Additionally, they became aware of the right to withdraw cooperation at any time. Parameters were also established so that issues regarding disclosure, sensitivity and trust were firmly secured. Participants were promised privacy, confidentiality and anonymity in initial agreements. They were assured that their interview transcripts would be used solely by the researcher and that they would not be seen by others. They were also guaranteed that their data would be completely anonymous.
5 Findings

5.1 General findings
First of all the small questionnaire of APPENDIX I was given to 12 teachers to answer. Based on their answers, eight of these teachers, four women and four men were chosen, all over 45 years old, two from each category of the four categories presented above were chosen. The eight teachers were interviewed between 1st and 10th of May 2015. All of them have extensive experience in this job working for 18-25 years and they had experienced the main changes that technology brought in society and in education in particular during the last 15 years. They have all participated in the compulsory basic ICT training of 2005-2007 that was organized by the Ministry of Education of Cyprus. Five of them have passed some of the 7 exams of the ECDL that were offered at the end of their training with three of the teachers (T1, T2 and T3) having passed all 7 exams of the ECDL. Only T1 and T2 did further formal training since then. All teachers interviewed reported having their own laptop computer, with an extra desktop computer at home in five of the cases. High speed Internet connection was available at home in all cases.

All teachers said that they do administrative use of ICT. The teachers T1, T2, T3, T4, T5, and T6 reported autonomous use of computers where T7 and T8 admitted that they manage only with the help of some colleague who knows technology. All teachers said that they make use of ICT at home for preparation of their lessons and for personal reasons ranging from simple Skype conversation with their children abroad to online shopping to exploring the libraries of the local Universities. The teachers T7 and T8 reported a minimum use (Skype, reading a newspaper and sometimes accessing online sources for their subject).

All teachers said that they felt that technology brings many possibilities but they also saw these many possibilities to bring confusion and finally stress in their professional life. Only T1 and T2 i.e. the teachers belonging to the first category felt that they controlled the situation at a satisfying degree. The same happened partially with T3 and T4. The rest of the teachers struggle not to let technology create problems in their job.

A strong feeling that most of the teachers had was that all the effort to bring ICT into schools had something wrong; they felt that the right focus of education had been lost. I particularly noted what T3 and T7 said from the beginning of our discussion:

“The main subject of the discussion in education has now become the technology and its use; not the humans”. (T3)
And

“The teacher is neglected, the student is neglected, the ICT is now the center of interest” (T7)

In a way the teachers felt that there is too much discussion about technology and the human side of education is set aside. Some of the teachers also had the impression that technology is imposed and it is not entering the education in some natural way.

The teachers except from T1 and T2, compare themselves with the younger teachers in the schools as this latter group has a certain degree of ease at the use of technology. Despite this they did not felt uncomfortable with that comparison as they felt that their colleagues could understand. The comparison and the feeling was harder with the pupils where they watched the younger generation to use latest technology something that created unease and insecurity for the teacher.

5.2 Perception of ICT acceleration

All of the interviewees answered that they are aware of a fast technological change. Only the teachers T1 and T2, though, perceived well the accelerated rhythm of technological development. This was obvious in the discussion with T1 who could name all the main changes in hardware and software of the late years that prove this fact. Said T1:

“There came the tablet and the smartphone but the big things came in the Internet. Blogs, podcasts, Skype and this social networks now contains it all, it brought everything upside down. The changes are denser now and can mean a lot at school if you take it seriously”.

Apparently teacher T1 not only observed the new developments of ICT but also felt their significance and potential impact on education. The same was true for T3 and T4 but at a lesser degree; they understood that technology accelerates and could name a few main products that prove it. For T5 and T6 there is simply “a continuous technological development at a fast rate” as T5 put it. For T7 and T8 the fast development of technology is a fact but it is a rather cloudy matter for which they had heard but could not say more.

5.3 Social change

As we saw earlier, according to the SA theory, the acceleration at a social level is expressed through the contraction of the present moment and is defined by an increase in the decay-rates of the reliability of experiences and expectations (Rosa, 2013, p.76). Social beliefs and actions have a
shorter and shorter period of validity. This contraction of time distorts in turn the time horizons of the individual i.e. his plans and visions for his future, namely the career of an individual. In the case of the teachers examined though the time horizons seem to be well established for all the teachers interviewed. This is logical given that they are permanent government employees. This was a very strong point in their narration. They do not feel that they have a risk of losing their job if they don’t do very well in technology. Only T1 and T2 understood ICT as a factor in social change. T1, for example, made the acute remark that “there is even acceleration in the way the children create relations and break them”. T1 and T2 also understand that investing in learning today cannot take you very far but either way they love to learn technology and update their knowledge simply because they love technology and not because they have to learn in order to find a better job. T2 clearly described his actual motivation when saying:

“You have to love computers in order to follow so many changes. You search, you learn, you experiment all the time. But to be honest, the Ministry does not press. Those who do nothing, what do you think, they lose the job? No, most of them will get their promotion at the right time”.

T2 wanted to stress that in Cyprus when you are a permanent government employee it is very difficult to lose your job or have any real effects because you don’t care about professional development. Moreover, when referring to promotions that are possible to everyone he was referring to the fact that in Cyprus your connections and your active participation in a political party can be more important when promotions’ time comes than improving your ICT knowledge. The teacher T8 spoke on the same line when confessing that

“I prefer to be myself. The inspector was polite to say ‘please use technology’ but I said no, I prefer to do my lesson as I did it 15 years ago, I believe my students learn a lot with my way, what Power Point can do more?”.

Being a permanent teacher then and especially feeling that you are a good teacher you see that your future in the job is given, possibly depended on other factors as e.g. the connections but surely not ICT.

5.4 Experienced increase in the pace of life

All teachers reported feeling an accelerated rhythm in their everyday life especially during this last decade. They mostly expressed this by referring to the lack of time as a major problem in their personal and their professional life. This according to their narration can take the form of shorter intervals during the day as T1 characteristically described:
“I love reading and I usually read more than one book so there used to be 3-5 books on my office at home. Now they are in my car as I usually read in the intervals of doing other things, waiting for my wife shopping or my daughter to finish the ballet lesson. There is no time to read a novel at home”.

Most of the others also blamed technology for the increased rhythms of life although the T7 and T8 were not absolutely sure for that fact. The increased pace of life expressed as a constant feeling of lack of time was also presented as a major problem in their professional life. Teachers from all categories stressed the fact that one major reason for avoiding ICT at school is that they need time to learn technology, to look for material, to evaluate this material and then organize it for use in the classroom. All the problems reported in relation to time and ICT use, came on top of an already pressed day in which “we run like robots to finish a list of things and do not realize when the day is over” as T4 put it.

5.5 Effects of Acceleration of ICT in the use of ICT by teachers

All teachers talked about ICT as a problem. T1 and T2 talked about ICT more as a challenge that they could face and less as a problem. Said T2:

“New software all the time but I enjoy it, you have something new to learn. And, to tell you the truth I am happy about that, it gives me more self-confidence I could say”.

T3 and T4 talked about ICT as a challenge which they struggled to face and as a problem at the same time (so they did not felt happy about it). T5 and T6 understood ICT as a challenge but felt subverted by it, finding it so difficult to face it so it was more of a problem. T7 and T8 had definitely decided that ICT is a problem, an unneeded one, and they had clearly negated it.

No one of the interviewees considered the acceleration of ICT development as a major problem in the ICT use at school. Instead they reported a number of other reasons as negative for the integration of ICT at school. For example T1 referred to the difficulties with the equipment:

“The equipment we have is sometimes old; you know, with so much bureaucracy it can take years from the time the government decides to buy computers until they finally reach the school. Besides, only the specialized labs are fully equipped and when one computer breaks down it has to be sent to the Ministry to be fixed. It’s so much trouble!” (T1)

T2 referred to the insufficient training provided:
“That seminars of 2006 were a good initiative from the side of the Ministry. But then they stopped, no more training from then on. I really feel that what I know I have learned it by myself!” (T2)

T7 talked in the same line and also connected the insufficient training to the lack of time:

“How did they expect us to use computers in the classroom? The seminars were only those we had ten years ago. They did it so fast, for me it was completely insufficient. It seemed that they expected us to learn at home by ourselves but I don’t have the time for such a thing.” (T7)

It was especially interesting to hear about the most negative impact of the system of evaluation of teachers that the Ministry has. As put by T2:

“You don’t really want anyone to know the things that you know. So you do not share with the others in order to get better marks than them when the inspector comes” (T2)

Another interesting factor that they discussed was the fact that the rest of the material they use at school and mainly the books have never changed to favor a parallel use of ICT in classroom. The same problem was noted by T1, T2, and T3 in relation to the curriculum:

“The curriculum is definitely not written for the new era” (T1)

Finally, the scarcity of time was by far the most negative factor according to the teachers’ sayings and it was mentioned and discussed by everyone. The big absent in all discussions was nevertheless the acceleration of ICT.

5.6 Relation to lifelong learning

They all understood the notion of lifelong learning well and they accepted it, at least in theory, as essential for the contemporary teacher. They also admitted that the main tool to perform the lifelong learning is indeed the ICT. T1 described it well when saying :

“Knowledge used to be in the books. Now it’s all on the Internet. You need technology to find it and technology to read it”. (T1)

Except from T1 and T2 all the other teachers seemed content with what they knew and they did not feel any urge to learn much more about their subject or in general for personal development. It was characteristic that at the start of the part of our discussion about lifelong learning all teachers talked generally about it and in an idealized manner. But when we came closer to what they actually do, most of the teachers refuse that ICT brought changes in their field of expertise.
“Come on, how much has the Greek literature changed because of technology”. (T7)

She admitted though that now she has access to a wide variety of material on literature analysis but still she said

“…but ok, you know, this is not something you need to search every day; I personally go to the Internet to find new analyses and opinions only every now and then”.

For both practicing lifelong learning and using more technology to perform it they tried to find excuses for not doing them. The lack of time was their main point. They complained having a myriad of things to do during the day so devoting time for acquiring new knowledge or trying to learn the new ICT tools for accessing this knowledge was “too much for such a stressed way of living” in T5 words. So, except from T1 and T2, lifelong learning remained an ideal possibility which teachers did not feel was urgent to exercise. Still they did not feel pressed by the fast changes of technology as having a modest knowledge of ICT - just to have access to some online resources- was seen as enough. The scarcity of time in their everyday life was their main excuse for not trying more.

5.7 The official side (interview with the director)

Besides the interviews with the teachers, an interview was held with the director of a Lyceum. The purpose was to discover the official situation in terms of ICT integration in Cyprus education. The situation was quite simple as revealed by the director in the interview: In 2005 a 3-year program (50% subsidized by the EU and 50% by the Government) was started in order that all teachers attend basic courses on ICT (Windows and MS Office use). At the end of this series of seminars there was the option for the teachers to sit the European Computer Driving License (ECDL) exams in order to prove their skills. It was not obligatory though to participate in the whole program nor was it sitting the exams. The older teachers avoided it but the majority of the teachers had attended the course. After 2007 when the program ended, the application of ICT in the teaching of the different subjects it is not considered obligatory. It was left on the inspectors of each subject to organize further seminars for the teachers of their subject and try to “exploit” the more technology-minded of the teachers to help the others in the use of ICT in the classroom. The administration of the school has officially no responsibility for the application of technology in the teaching process. The director admitted that except from some special classrooms, all the other classrooms in the school are not suitably equipped although there is a number of portable computers and video projectors for the teachers in case they want to use them in not-equipped classrooms. The director
seemed well aware of the fact that ICT provides for many possibilities that teachers do not exploit and that the majority of the teachers only do a minimum effort in the use of technology in order not to have problems in their evaluation by the inspector. The director stressed though that the contemporary teacher in Cyprus faces many more problems as e.g. the multinational, multicultural classroom, with many children coming from countries with political and economic problems, with little knowledge of the Greek language. He seemed to consider the effort of the teachers sufficient given the general context into which they work.
6 Discussion

6.1 How teachers perceive the ICT acceleration

In all the cases under exploration, teachers note the fast development of technology. The difference between them is the degree of detail at which they see this development. T1 and T2, the “geeks” of the ensemble, follow the developments and they search, they love the new, they experiment, and they can name easily the main new developments. T3 and T4 do about the same but without much experimentation and exploration although they understand well the phenomenon of acceleration. T5 and T6 understand the changes as “fast” and “continuous”. T7 and T8 know that technology advances rapidly but for them technology is something like a cloud. No clear view about what are the changes and their implications. It is important that while all teachers understand the fast changes only T1 and T2 understand well that there is an acceleration and not simply a fast development of technology. T3 and T4 perceive acceleration partially and the rest do not speak about acceleration. Their profile regarding the way they understand ICT acceleration is therefore consistent with the profiles of the four categories as described by Mamma and Henessy (2013).

Regarding the acceleration of technology in their professional life, with the exception of T1 and T2, the teachers in this study give the impression that they observe the technological developments as third persons. There are two possible reasons for that: the first reason is probably the fact that they are all permanent government employees and something extraordinary has to happen in order to lose their job. Karagiorgi and Symeonu (2007) explain that “[in Cyprus] there are no specific requirements for professional development that teachers need to meet in order to maintain their jobs and no agreed standards for in-service training programmes, while participation in courses does not have a significant impact on promotion processes” (Karagiorgi & Symeou, 2007, p.178). Therefore, officially, not using ICT in the classroom does not have a significant impact on the teachers. Consequently the teachers do not seem to take technological advancements personally or feel the responsibility to engage in the process. They give the impression that if it was not obligatory in no way they would consider technology. T1 and T2 differ in that they do what they do motivated by a special interest to technology and not because it is imposed to them. The negative effect of the permanence of the job does not mean, of course, that permanent jobs are a bad idea but it rather means that the employer, in this case the Government of Cyprus, does little to motivate the teachers in learning and using ICT. The second possible reason is the lack of digital culture. The three quarters of the teachers in this study (i.e. all except T1 and T2) do not seem to accept ICT as a defining element of our times (Mioara, 2012). Or maybe it is the uncritical adoption of ICT into
education that never convinced them that by using it in the classroom something important changes (Aviram, 2009). Whatever the case, for the moment they seem to have stabilized the situation: one lesson with a Power Point (PP) presentation the day the inspector is in the classroom and that is enough. The rest remains on their will but if they do nothing they don’t feel guilty. Therefore they chose to use technology in order to sustain their existing practices rather than use it to reform them according to what technology can offer as described by Karasavvidis (2009).

6.2 The effect of the acceleration of social change on the ICT use by teachers

According to the SA theory (Rosa, 2013, p.74) we have today acceleration in the social change. This takes the form of a contraction of the time horizon of the individual. An important aspect of this, is the fact that you cannot program your life on a long-term basis. Changing a job several times during the lifespan tends to be the norm in the modern societies (Rosa, 2013, p.112) and if you invest today in learning, there is no guarantee that the knowledge you acquire will take you very far. Technological acceleration makes this worse every day but teachers did not seem to feel such a pressure in their professional life. This is surely because of the fact that they were all permanent-position teachers. Their career no longer depends on their good knowledge and use of technology so they do not really consider how an accelerated ICT development brings new knowledge, new methodologies, new philosophies of teaching and learning. In accordance with a study of teachers’ professional development in Cyprus (Karagiorgi, 2012, p.88), the teachers in my study do not feel the responsibility for their professional development; they rather feel comfortable and secure behind the permanence of their job and they prefer to do a minimum use of technology just not to have problems with the inspector. Therefore while the acceleration of ICT does affect the social changes according to the SA theory this fact was not detectable in the examined group of teachers.

6.3 The increase of the pace of life and its meaning for the teachers

The increase in the pace of life is the third pillar of the SA theory (Rosa, 2013, p.77). The accelerated pace of life is expressed mainly as a constant feeling of scarcity of time. Rosa explains that this is a paradoxical effect of the technological development in our life. Technology promised that by providing modern equipment of various types it would save humans much time. Technology certainly provided such tools but at the same time humans not only have never got more free time but they have gone to the other end feeling constantly that there is not enough time to do what they want. (Rosa, 2013, p.131) This was made obvious in the responses of the teachers as in many different cases they refer to the scarcity of time. Although the teachers in this study do not seem to
relate directly the technological acceleration to the increased pace of life – and thus to the scarcity of
time problem - they surely all experience it and feel that it affects heavily their personal and
professional life. The teachers examined have all the characteristics that Nicole Aubert (2009)
presents in her analysis of the “pressed man” when she explains that the increasingly complex
environment where the cult of urgency reigns and where the contemporary humans function leaves
no margins for reflection and creativity (Aubert, 2009, p.247). The teachers thus experience ICT as
one more problem in their professional life due to the lack of time to learn the ICT tools, to search
for material, to evaluate it and then bring it to a form suitable for the classroom. Moreover the
increased pace of life seems to prevent them from functioning properly as lifelong learners due to
the lack of time which could be devoted in their further learning.

6.4 Effects of the acceleration of ICT on the use of ICT by teachers

The teachers made obvious that there is a big number of reasons that prevent them from using ICT
in the classroom. Clearly the acceleration of technology was not one of them. The reasons they list
are according to the literature and match most of the reasons found in the literature review of this
study (Bingimlas, 2009; Inan & Lowther, 2010). The time factor notably prevails all other factors as
denoted in the research of Karasavvidis (2009). It is also interesting that the time factor is
something that engages their professional as well as their personal life. Generally though, no
pressure is exercised on teachers to adopt ICT in classroom which seems to be a lack of long term
strategy on behalf of the Ministry. In the same line, the Ministry does nothing to cultivate digital
culture and thus teachers do not really believe that ICT can bring any important changes in
education. Speaking about culture I also have to underline what the teacher T2 revealed: teachers
do not share their knowledge with their colleagues. According to T2 there is a lack of sharing
culture. Teachers feel working in a competitive environment and they do not have the culture of the
Internet which is clearly that of sharing especially in the last years with the use of social networks.
And while the relevant research shows that sharing knowledge between the colleagues is a major
way for the teachers to learn and adopt ICT at school (European Commision, 2013) teachers in
Cyprus seem to work towards the opposite direction because of the system of their evaluation.
There is also pressure in the curricula as again denoted in Karasavvidis (2009) and the books are not
written with the ICT in mind. Conclusively, while the teachers analyzed many reasons for not using
ICT for teaching purposes, the acceleration of ICT was not one of them. Instead they chose to
establish a light relation with technology and make a minimum use of it only to the extent that they
do not have problems with the Ministry.
6.5 How teachers’ lifelong learning is affected

As we saw earlier teachers do not feel the acceleration of social change as the SA theory implies. This factor affects the time horizons of an individual with the social events having less and less duration (Rosa, 2013). This fact could have affected how teachers see their professional development i.e. how they see themselves as lifelong learners. While they understand that lifelong learning is important for them as knowledge workers and that the tools to exploit all the contemporary knowledge are indeed ICT tools, they do not take the acceleration of technology seriously and as something significant for their lifelong learning. Still the acceleration of ICT affects teachers as lifelong learners in another way that of the increased pace of life and therefore through the scarcity of time. The increase in the pace of life which happens mainly because of the technological acceleration, as the SA theory explains (Rosa, 2013), resulted in the feeling of a constant lack of time. Lifelong learning is then affected negatively by this lack of time as being a long time process which needs investment of time all through the life of the individual.

6.6 The official side

In the interview of the director the official policy was revealed. There is no actual strategic plan for the integration of ICT into education. Rather the system encourages the initiative of the individual while a collective strategy is absent. Such a policy leaves the pedagogically innovative practices of individual teachers isolated from the school and the educational system as a whole (Mama and Hennessy, 2013). The school does not have any involvement in the integration of ICT into the teaching process and it is only concentrated in solving other problems that exist in the school environment which are considered more important. The responsibility of ICT integration is put on the inspector of each subject a fact that highlights a fragmented policy without a vision.

Overall, the findings of this study reveal three facts that can answer the research questions:

1) Half of the teachers understand the acceleration of ICT developments; the rest realize that there is generally a fast technological change. More specifically only T1 and T2 understand well that there is an acceleration and not simply a fast development of technology. T3 and T4 perceive acceleration partially and the rest of the teachers do not speak about acceleration. Nevertheless all teachers do feel an increased pace in professional and personal life which according to the SA theory is mainly a result of the acceleration of technology.
2) The acceleration of ICT developments is not a significant factor in the ICT use by teachers in the classroom in Cyprus. There are quite a number of other negative factors, enough to dominate the scene and that make the acceleration of technology coming last and being the least in the list of factors. For example, teachers refer to problems with the computer equipment in the school, the service provided in case of technical problems, insufficient provided training from the side of the Ministry of Education, the interest for professional development not being a factor for promotion, and books and curriculum not taking into account the ICT use. The many ICT developments that come into the market at a high and ever changing rhythm i.e. the acceleration of ICT development did not constitute a problem for the teachers in this study.

3) The acceleration of ICT developments affects the teachers as lifelong learners in the means of an increased pace of life. The increase in the pace of life which happens mainly because of the technological acceleration, as the SA theory explains (Rosa, 2013), results in the feeling of a constant lack of time. Lifelong learning is then affected negatively by this lack of time as being a long time process which needs investment of time all through the life of the individual.

The above results can be attributed to a great extend to the fact that all the teachers are permanent-position teachers. The teachers have no real implication in their job and little implication in their personal life if they do not adapt to ICTs. This fact combined with a lack of strategy on behalf of the Ministry to give them motivation to learn and use ICT, makes teachers behave as watchers rather than participators in what happens around them. Instead of actively participating in their constantly changing environment the majority of the teachers have consciously chosen to practically stop the integration of technology into education by using mainly Power Point presentations in the classroom which, for the time being, the inspectors seem to consider enough.
7 Implications and conclusion

The acceleration, imposed today by technology, brings a deregulation of our time at a personal and at a lifelong scale sense (Aubert, 2009; Rosa, 2013). The increased pace of life does not leave the contemporary teacher to create a constructive and careful relation to technology and thus a productive one. This is because it does not leave time for reflection. This in turn gives a good excuse to teachers to avoid using ICT in the classroom, not to follow technology developments and not perform lifelong learning. In this study it was characteristic how all the teachers admitted living a life with pressure and stress and much running in their everyday life. Furthermore, except from two teachers, all the others actually understood technology as one more reason which creates pressure in their professional and personal life. Into these realities we ask that a teacher becomes a lifelong learner. But in an accelerated contemporary society, where “short-run realities are favored” (Rosa, 2013, p.140) have adults really accepted the idea of lifelong learning? Lifelong learning needs a significant investment in time and effort. If we consider that learning is performed through technology and technology accelerates steadily, adults need constantly to update their knowledge about the tool they will use. Therefore we can say that technology provides for many opportunities but at the same time it subtracts the ways to exploit these opportunities due to the time pressure. In a way then, technology with its acceleration contradicts lifelong learning because lifelong learning needs a large time horizon and technology deconstructs such a thing. Most of the teachers in this study showed that, in case there is a way to avoid a substantial relation to lifelong learning they will do it. So instead of chasing the changes of ICT they preferred a modest use of ICT at school just not to create problems in their job. This attitude constitutes a real and conscious superficial relation of teachers to ICT.

This superficiality can also be encountered from another path in this study. We saw that the acceleration of ICT has led the teachers to prefer a simple reactive action (mainly using PP presentations in order to minimize their problems) which only solves the problem in the very short run and fails to transform education creatively. An analogous lack of vision is seen in the level of the Ministry. This is indeed a characteristic feature of the contemporary society. According to various researchers, politics are no longer able to follow the rapid and complex economic and technological mutations and therefore politics is not the way by which the contemporary society can transform itself. This is evident for example in the political action scene. The political action, according to Revault d'Allonnes (2012) “has become essentially reactive. Reaction to the movements of the financial markets, to the ecological changes, to the social and cultural mutations” (Revault d'Allonnes, 2012, location 1990 (page numbers not available), my translation). So the
Ministry, compared to the teachers, is no less short-sighted and its actions are simply reactive to the big changes that we experience today and in no sense strategic. In other words, it seems that we try to cheat ourselves. For how long can we continue in this mode is not easy to say but in my opinion it is not for long. The acceleration of technology does exist and the teachers reported noting it. If we don’t consciously do enough at a governmental level, we will wake up in a morning with many surprises.

The solution, for the greatest part, can be given at a policy level. And what we need now is a visionary policy to work on two directions: The philosophy of our educational system and the practical side of education. On the philosophical level we need to say clearly and honestly to ourselves where we stand now. And then decide on the most basic of the questions: What is education? What do we want as Cyprus in the 21st century for our citizens from education? We have to understand that the acceleration of technology is driven mainly by “the categorical capitalist imperatives of maximizing the amount of salable goods or services produced per unit of time and of being the first to introduce innovations” as Rosa (2013, location 316) described it. These institutions do not care about our development. So unless we know very well what we want we will find ourselves running behind an ever accelerating system of production/marketing/consuming which invests on our confusion. But once we did that first essential step i.e. redefining our philosophy, we can go on to the practical side of the story and do research locally to find what we really need to take from the modern ICT. Therefore the point is not to negate technology but rather to investigate and adopt technology according to our needs and above all try to discover what is the essentially new that technology brings. Insisting in simply doing with technology what we used to do with traditional methods of teaching does not benefit us much and in any case this is not the application of ICT in education. The thing is to find what is the new that new technology can bring in order to achieve our goals more effectively. In this way technology will be a tool that will help us achieve the visionary goals of education because otherwise our education will be a tool for large companies, a laboratory where new products are sold or tested. Under such conditions teachers will certainly continue to understand ICT as one more factor that presses them in their job.

On a further issue, with this study I think it is revealed that teachers need another type of seminars: a series of seminars on the philosophy of ICT i.e. what are the implications of ICT on our lives and on our society. The acceleration does exist and they experience it but they do not understand how much they are affected by it. Such a seminar could help them go beyond mere learning of software and hardware but even beyond pedagogical seminars. They will proceed to “critical reflection and higher-order thinking” as Karayiorgi and Gravani (2012) put it. These considerations can be very
useful when designing the digital literacy of the teachers in a lifelong learning context and as part of a wider digital policy of the Ministry of Education to face the acceleration of ICT. Considering that 2015 is the year which brought a big change in the system of recruiting teachers in Cyprus (with examinations rather than recruiting from a list) this means that we are at a good stage to act.

Sutherland (2014) in a remarkable study about the accelerated society holds that “There is no equilibrium to be reached—no perfect speed—and as such, social processes are increasingly driven not by rational ends, but by an indeterminate demand for acceleration that both defines and restricts the decisional possibilities of actors” (Sutherland, 2014, p.49). It can be that education as a classical institution of society is already trapped in such a continuous demand for change which exactly has uplifted speed as an end in itself. But if indeed ICT is a subject of learning inseparable from the needs of learning for the contemporary teacher then education is in front of a big dilemma: Will it play the unending game of acceleration that ICT imposed or will once more reinvent itself revisiting its very foundations and answering in the contemporary world the big question: What is education?

7.1 Limitations and further research

The question of acceleration is not only a problem to be solved now but rather one that will guide us to develop a strategy for the future as it is not simply fast change that happens but an accelerated one. Consequently even the younger generation that is much more familiar with ICT will have to answer questions related to technologies new for them. How, for example, will future teachers accept and use Artificial Intelligence or robots in the classroom? Studying the ICT invasion in our life and its consequences should be continued and the relation of ICT to education should of course be a central part of such a study. For the moment let us see the limitations of this study and try to identify possible and suitable future research.

This study was carried out in Cyprus and intends of course to contribute to the understanding of the acceleration of ICT and its effect on education. Cyprus nevertheless has not a perfect relation with technology as my everyday experience has taught me. I believe therefore that similar studies should be carried out in countries where traditionally they have better relation to technology such as the Scandinavian countries. Even a comparative study between several countries would contribute very much to understanding how the accelerated changes are faced. Another thing is that the teachers in this study were all permanent employees of the government. If we researched in the environment of a private school where teachers are not permanent employees the image could be different. Moreover, my research was done for teachers that are over 45 years old. Although age is not
necessarily a defining factor of the relation teacher–technology (e.g. T1 is 48 and T2 50), the group <45 should be researched too.

This study opens the way for further research on the subject of acceleration in relation to education. First of all a detailed study should be made to document the development of hardware and software that especially affects education. Special attention should be given on how the Internet changed the scene by giving the possibility for new ideas to pass directly to a practical level through the ready and functioning global internet. Such a study should describe when exactly the most influential tools/ideas appeared and what their route was. How often new sites with new ideas have appeared, how the hardware with less an impressive change relates to the software development and how each new idea that appeared on the Internet as a site, triggered other ideas perhaps even more influential.

Then a better understanding of the ICT acceleration should be attempted by analyzing how this acceleration relates to the other factors that prevent teachers from using ICT in the classroom. Special attention to the time factor is urgently needed. There should be a separate study, I believe, on how the teachers as adult learners relate to time. More generally, time studies should be connected to adult learning the sooner as the problem of time is a major problem of our era.

Regarding the workplace learning of the teachers, the acceleration of technology should be taken seriously into account. Therefore a research of new designs of in-service training at schools that will incorporate the ICT acceleration phenomenon is highly relevant. Today that innovation is, at least in Europe, a serious part of the strategy to escape the economic (and not only) crisis, a severe problem is created for education: innovation will steadily feed the market with new hardware, software, and ideas. Consequently the teachers will have to update their ICT knowledge in an even higher rhythm. We should then research how we solve their workplace learning in a way that will take into account the accelerated ICT developments. Such a research can help us set down pragmatic expectations when training teachers; how much new knowledge can teachers really absorb and how much can they bring to the classroom?

Another important relation that should be researched is how the personal use of ICT promotes the use of ICT at school. The ICT is a major factor that removed the barriers between the personal and the professional life of teachers. We know little on how the acceptance of technology and its use in the everyday life for personal purposes influences the use of ICT by the teachers at school. It is thus interesting to know how the personal use affects the professional use of ICT and at the same time very important in the lifelong learning plans of the teachers.
Furthermore, as we saw earlier, it is an important part of the story with the acceleration of technology that it is not always driven by the needs of the human beings or organizations but it is the result of the logic of the market. The marketing laws are embedded in the tools that we use and we are supposed to learn every day. Therefore the neoliberal ideas that are behind this tremendous effort for more profit for the big, global multinationals should be studied as a cause of acceleration. How the neoliberals exploit the dynamic of the acceleration of technology and what is the impact on education is an interesting question. This can take the form of studying technological acceleration as a means of temporal colonization in the everyday life of teachers which affects even more broadly adult learning.

Finally the effect of the ICT acceleration on the teachers’ identity is an area yet to be explored. In this study the teachers admitted that they compare themselves with the students who are very familiar with technology. But comparing with younger teachers that use technology better was not a problem for them. Despite this, the identity of the teacher is affected by the general changes that technology brings and it is indeed a multi-dimensional phenomenon to study. There is no doubt that in the recent two decades teachers’ identities have been affected very much by a technology that not simply develops fast but indeed changes in an accelerating rhythm that sweeps away all social standards.
APPENDIX I

Teachers’ Categorization Survey

Gender: ......................................................................................................................
Age: .........................................................................................................................
Subject you teach: ....................................................................................................

How well do you use the following software (complete with a ✓ under the suitable number. 5 is the highest, 1 is the lowest)

<table>
<thead>
<tr>
<th>Software</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powerpoint</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet Explorer or other browser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other specialized program (please write the name of the software)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How often do you use a computer and/or Internet in the classroom?

Do you use a computer for preparing a lesson e.g. write a handout or prepare a presentation?

Do you use the Internet for preparing a lesson e.g. learning new concepts or search for material?

Do you change the pedagogy in the classroom because of the ICT use?

Do you use computers and Internet for administrative purposes at school e.g. complete an application to the Ministry, be informed on the school program
APPENDIX II

Interview guide for the teachers

General acceleration in our lives, ICT acceleration

1. Do you feel that our world accelerates?
2. Do you find your everyday life to be accelerated? Compare it with your life 10 and 20 years ago.
3. Do you find your professional life to be accelerated (more things to do, to learn, more often)?
4. How do you understand technological acceleration. Can you name some of the latest ICT developments?
5. Have the demands for learning new things increased over time? Has the demand for learning technology increased?

If and how the technological acceleration affects the ICT use by teachers at school (for administrative and teaching purposes):

1. What does technology mean to you?
2. What are you required to learn for your job, what the Ministry demands (or the inspector). Is technology a part of these things?
3. Do you feel that the employer (the government) does everything needed to help you learn the new?
4. Do you have an inferiority feeling comparing yourself to your colleagues? Make a comparison with the younger colleagues and you and the older and you.
5. Do you have an inferiority feeling comparing yourself and the pupils?
6. Do you find that technology developments affected your subject of teaching?
7. Do you feel that with technology you can achieve better things in the teaching of your subject?
8. Do you use ICT tools for the preparation of lessons? Do you use ICT in the classroom? How and how often?
9. Please name some reasons that prevent you from learning technology.
10. Please name some factors that prevent you from using technology in the classroom.

If and how it affects their learning for professional in the lifelong learning sense

1. What is lifelong learning to you?
2. How do you understand your professional development?
3. Do you believe technology has something to offer to your professional development?
4. What ICT tools do you use for learning at home? How often?
References


