Categories of Conceptions in Karlstad Community Classrooms:

An analysis of educator interviews regarding new media technologies as teaching tools.

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Summary

In fall of 2011, Karlstad municipality adopted a new policy wherein all first year high school students are to be issued their own laptop computer as part of the Dator One-to-One program. The participation in this policy offers an opportunity to study how teachers are experiencing the integration of new media technologies as part of their role as educators. A series of open ended standardized interviews were conducted in late 2011 in order for a group of High School English teacher to express their experiences, strategies and opinions about this phenomenon. The purpose of the study was to establish a set of categories of description, through phenomenographic analysis, that would be available to facilitate further study as teachers in the area became more accustomed to the situation. The study was partaken from a social/culture theoretical perspective which posits that learning is a social/communicative process. The phenomenographic analysis of material resulted in three categories of description; Experience of Phenomenon by Comparison/Relation, Teaching Strategies in relation to research phenomenon and Phenomenon in Application. Each category of conception in turn consisted of two pairs of sub categories. These categories of conception should be taken into consideration when planning future research projects concerning educators’ experiences with new media technologies.

Key words: education strategy, media technology, pedagogy
Abstrakt
Från höstterminstarten 2011 har alla nya elever inom de kommunala gymnasieskolorna i Karlstad och Hammarö tillgång till en egen dator, en satsning som brukar gå under beteckningen *en-till-en*. Denna situation öppnar för en möjlighet att studera hur denna tekniska förändring också påverkar lärares upplevelse av teknikskiftet och hur lärarna uppfattar att tekniken förändrar skolvardagen. Under december 2011 intervjuades 47 lärare i engelska (du skriver rätt antal) utifrån en gemensam intervjuguide med öppna frågor kring erfarenheter, strategier och åsikter om hur det är att arbeta i klasser som omfattades av en-till-en-satsningen. Syftet med studien var att kategorisera lärarnas uppfattningar och hur de erfar denna nya situation; detta då med hjälp av en fenomenografisk analysmetod. Studien tar sin utgångspunkt i ett sociokulturellt perspektiv där lärandet ingår i en social kommunikativ process. Resultatet av analysen pekar mot att det går att dela in lärarnas syn på den nya situationen i tre huvudkategorier; erfarenhet av fenomen genom jämförelse; undervisning strategier i förhållande till fenomenet; fenomen i praktik.

Nyckel begrepp: utbildning strategier, medieteknik, pedagogik
1. Introduction

In what is arguably his most groundbreaking and prophetic work, *The Gutenberg Galaxy*, Marshall McLuhan (1962) debates, among other things, how changes in media technology affect an individual’s ability to perceive their culture as well as the culture in which they find themselves. In as early as 1962, McLuhan observed that “…when technology extends one of our senses, a new translation of culture occurs as swiftly as the new technology is interiorized” (McLuhan, 1962/1995, p. 135). Whereas McLuhan’s discussion focuses on more traditional media technologies such as television, film and more specifically the alphabet itself as media technology, today’s so called “new media” or the quickly emerging digital media technologies that accompanied the rise of the internet, are being *interiorized* or rather internalized as they are becoming a part of our everyday lives and, in a broader sense, redefining our culture.

For the pedagogue, the process of internalization leads one to consider how individuals become literate in these emerging forms of media and more specifically, in the case of this research project, what role does school play in the process. The debate around how emerging media should be approached in the culture of the school classroom is ongoing and unending as media technologies develop, change and evolve. The integration of computers with the Swedish learning environment has been underway for decades but the role of the computer as a learning tool is changing. In her study *New in Cl@ss* on how computers influence the work and deeds of teachers, Gunilla Jedeskog observes that:

> Beginning in the mid-1980s, there appears to be three main motives in the general debate behind the ambition to implement computer technology in the classroom: democracy, preparation for working life, and improved learning [Jedeskog, 1996] Towards the end of the nineties, a fourth motive came to be emphasized, namely IT as a force for change (Jederskog, 2000, p. 135).

Simply put, the role of media technologies in our schools is changing and the educator will inevitably change along with it. So what does the emergence and internalization of new media technologies mean for today’s teachers? Whether the debate is concerning literature, film, music or the internet, educators are continually forced to adapt their lessons to the influence of the media landscape that their students inhabit. The Swedish Education Act (2007) defines the role of public education to “promote all children’s and pupils’ development and learning and a life-long desire to
learn [trans]“1 (kap-1 § 4) and to provide an education “based on scientific evidence and proven experience [trans]”2 (kap-1 § 5). As with much legislation, this definition requires certain amount of interpretation as well as creates complications. How can teachers succeed in promoting lifelong development and the desire to learn based on proven experience when newly emerging media technologies are evolving so rapidly? Jedeskog ruminates over the paradox that teachers face, offering that “…information technology is expected to be a means to fulfill this goal [of students managing their own learning] and at the same time the use of ICT may be regarded as one of the reasons for this goal” (Jedeskog, 2005, p. 11). This seeming paradox poses significant challenges for teachers hoping to adapt to evolving media landscapes. Whether this adaptation is conscious and proactive or unconscious and reactive, whether the teacher struggles to integrate certain aspects of media technologies while resisting others, all action or inaction are reflected in lesson planning and will determine how well today’s students will be prepared for tomorrow’s needs.

How well prepared we are to adapt to changing media landscapes can be expressed in the often debated concept of media literacy. W. James Potter uses a broad perspective regarding media literacy describing it as “…people’s ability to access and process information from any form of transmission” (Potter, 2011, p. 12). To this effect, everyone is media literate to some extent, be they student or teacher, the challenge for educators then lies in developing an awareness of or higher degree of media literacy in themselves in order to better serve their student’s needs. Mark Warschauer (2006) argues that the emerging media technologies such as “…computers and the Internet had special values in the classroom because they had become major tools of scholarly and business activity in a way that the prior media never had” (Warschauer, 2006, p. 20). The importance of relevant and up to date research regarding the need for educators to consider and reconsider the influences of new media technologies is the starting point for this research project.

1.1 Motivation

Research into how teachers are experiencing the transition is both a necessary as well as a daunting task. The subject is particularly relevant to teachers in the Karlstad area at present since the Karlstad Municipal Council decided, December 9th 2010, that all first year high school students (ettor i gymnasiet) are to participate in the Dator En till En (One-to-One) program beginning fall semester, 20113. The Dator One-to-One program is an attempt to integrate ITC in the classroom by issuing a

1 Skollag 2010:800: kap-1 § 4 “Den ska främja alla barns och elevers utveckling och lärande samt en livslång lust att lära.”
2 Skollag 2010:800: kap-1 § 5 “Utbildningen ska vila på vetenskaplig grund och beprövd erfarenhet.”
laptop to each and every student however, by introducing laptops into the classroom an expectation is created that the teacher will find a way to make use of them as an educational tool. There have been teachers in the Karlstad area whose students have been participating in the Dator One-to-One program for some time but it has become municipal policy that all High School students will have their own laptop computer within the next three years. This decision creates an interesting research opportunity regarding teacher’s different perspectives, both positive and negative, regarding the inclusion and influence of emerging digital media technologies, not on society as a whole but as an element in their classrooms on a daily basis due to sweeping municipal policy.

In terms of media communications studies, the current situation in Karlstad area schools offers an opportunity to study how the Karlstad Board of Education is trying to come to terms with the changing media technology landscape and how those changes are affecting the day to day of education professionals. The recent decision and implementation of the Dator One-to-One program reflects what is occurring in society as a whole. New media technologies such as increased mobile connectivity, social networking and smart phones to name a few, are becoming more and more integrated into our children’s education as “…computer and ICT know-how are often seen as pupil’s fourth basic skill, after reading, writing and arithmetic” (Jedeskog, 2005, p. 11). The decision to introduce digital media technologies into the classroom raises specific questions relating not only about how well equipped students are to use new technology effectively but more importantly how are the teachers themselves experiencing the change. Research into how teachers experience the integration of new media technologies center around the concept of media literacy among the teachers themselves. In order to improve the integration of laptops as a part of the day to day classroom environment it is necessary to begin with an understanding of how educators are experiencing the internalization of the new technology.

The period of change that Karlstad Community schools have now formally embraced presents us with both an opportunity but also a responsibility to monitor the transition to fully digital classrooms. This study is motivated by the need for feedback from educators in order to improve the use of laptops as teaching tools as “…the main purpose of feedback is to reduce discrepancies between current understandings and performance and a goal” (Hattie, 2007, p. 86). As I realize that the scope of this research paper does not allow for a realistic opportunity to draw reliable and valid conclusions on the subject, I propose instead to provide ground work for later study in the area. This research project intends, through analyzing a series teacher interviews, to provide insight into the various areas that later research needs to focus on in order to continually improve the use of laptops.
as a teaching tool and in doing so ensure a higher degree of media literacy amongst both teacher and student.

1.2 Definitions and Key Concepts

**Literacy**: During the interview process the concept of literacy was somewhat problematic as many of the interviewees had not considered media literacy from a media and communications perspective. Within media communications studies literacy is much debated concept and hotly debated, it is often thoroughly defined by researcher using the term. Warschauer’s (2006) investigation regarding today’s wireless classroom, *Laptops and Literacy*, focuses on the difference between *academic* and *digital* literacy, a specification adopted throughout this research project in order to clarify and simplify a rather complex concept. According to Warschauer’s definitions *academic literacy* refers to “literacy practices and competencies that allow people to succeed in academic work in schools and universities” whereas *digital literacy* refers to technological competencies that generally “refer to making meaning from and interpreting of texts in computer based digital realms” (Warschauer, 2006, p.33). Media literacy itself, as defined by H. James Potter, is a set of perspectives that are actively used when interpreting meaning in the messages we encounter (Potter, 2005, p. 19). His particular approach to the practice of media literacy consists of an awareness of goals, specific knowledge as well as a set of skills for actively interpreting media messages. This terminology was difficult, if not impossible to use in the interview process as it lacked meaning for individuals outside the field. Gripsrud (2011) explains cultural competence as our ability to interpret signs and codes imbedded in conventional media that creates a relationship to one another (Gripsrud, 2011, p. 147). Media Literacy however is an active awareness of the process behind our cultural competence. Media literacy serves various purposes; it creates an appetite for a wider variety of media messages, it empowers individuals to control the effect of media and it allows you to recognize the goal of media sources and take alternate steps (Potter, 2005, p. 26). This research project is interested in helping to gauge educator’s media literacy through categorizing their conceptions and cultural competence of laptops as media sources in the classroom.

**Institutionalization**: The adoption by Karlstad School Board of the Dator One-to-One is an example of the third and final stage of what M.G.Fullan (2001) explains as the process of innovation implementation which include; initiation, implementation and institutionalization. The institutionalization of a media technology reveals that a particular innovation is becoming a part of regular practice. This is the stage of the process that is currently occurring in Karlstad Municipality Schools as the use of new digital media technology has become institutionalized. To return to McLuhan’s (1962) concept of media technology extending our senses, the institution of education
in Karlstad municipality is *interiorizing* internet based media technology and the process of *sensory extension through technology* is officially underway, at home and now in the classroom as well.

**Phenomenon:** Phenomenography is qualitative methodology that is used when researching the different ways that individuals experience and relate to a specific phenomenon. Within the context of this research project the term *phenomenon* refers to the emergence of new media technologies. This is meant to include the surge of new technologies that have accompanied the rise of the internet, from social networks to wireless connectivity as well as the devices that enable our on line personas to interrelate with our “real world” environment.

**Conception** is a term used within phenomenography to describe a set of categories that reflect a view of a phenomenon. Simply put “[p]henomenographic research seeks to describe the major features of the different ways a group of people relate to a phenomenon” (Bowden, 200, p. 5). and the term ‘conception’ is the name given to a group of features based on the collective perceptions of interviewees. Roger Säljö considers the term *conception* as a core element of the methodology and that “having a clear definition of this concept is a precondition for being able to judge it as a research paradigm” (Dall’Aba, 1996, p. 27). Though there is a difference between an *individual’s* conceptions and *categories of description* that develop through phenomenographic analysis, within the scope of this research paper the term conception refers to a group of a categories based on the observation of the experience of a phenomenon. In this context a conception is constructed through analysis, not through individual experience as the term is generally understood.

### 1.3 Scope and Limitations

The adoption of the Dator One-to-One program by Karlstad municipality served to provide an opportunity to research the subject in a geographic area that has uniform expectations through policy. Regardless of the individual teacher’s interest in the use of ICT as a teaching tool, all teachers are now required to develop strategies that include laptops and all of the emerging media technologies that contribute to a wireless classroom environment. This being the case, the project is also constricted by various limitations, particularly when considering time and the size of the research team. The Dator One-to-One program has only been in place for one term so the actual experience that every teacher has in the demographic area in question is somewhat limited. The aim of the project is as a preliminary investigation into perspectives and it is certain that those perspectives will change with exposure to practical experience; such exposure will undoubtedly affect opinion and teaching strategies as well. A more rewarding and thorough research project would do well to be conducted over a longer span of time in order to measure how these perspectives shift, positively or negatively, over time. Added to this time restraints is the fact that a
thorough phenomenographical research analysis is generally undertaken by a research team, rather than an individual, in order to ensure reliability in discovering categories. The process of analysis by various team members of the same transcripts should produce similar categories ensuring reliability. This being said, phenomenographic research method is a process that must be learned through practical experience therefore, this project will be understood as the preliminary phase of a process and that “learning to undertake the research is a useful outcome in itself”(Bowden, 2000, p. 59). These limitations have concentrated the aims of this research project to the point where the results should be understood as the first stage of feedback and category identification upon which future more involved research project aimed at mapping teacher’s media literacy can be based.

1.4 Aims

John Dewey (1897), in his essay My Pedagogic Creed proclaims that “I believe that the school, as an institution, should simplify existing social life; should reduce it, as it were, to an embryonic form” (p. 9). In agreement with this statement I feel that the integration of computers in our classrooms should reflect the integration of computers in life outside of schools and that this process needs to be monitored to be optimized. As a teaching student I am interested in what the phenomenon will mean for professional educators who endeavor to prepare their students for the unknown landscapes of tomorrow. Fullan’s stage model explanation of innovation is rather basic and as Jedeskog points out in Changing Schools, “…life in school is continuously involved in many different processes” and that “teachers need time to learn how to handle and how to use the computer as a pedagogical tool” (Jedeskog, 2005, p. 25). At present, all teachers in Karlstad municipality are coming to terms with the institutional internalization of emerging new media technologies.

In order to better ensure that we are preparing our students for the challenges of tomorrow educators need to map their own degree of media literacy. This research project aims to identify the various perspectives or conceptualizations among high school teachers in the Karlstad area concerning the effect that emerging internet based media technologies is having on their experience as educators. By identifying these perspectives through a phenomenographic analysis of feedback I hope to provide categories of data regarding how Karlstad’s High School educators are approaching, experiencing and adapting to the Dator One-to-One program from which future research can begin mapping the progress of media literacy amongst our educators.
1.5 Central Questions

The central questions of this research project intend to discover how educators are experiencing the integration of laptops with their classroom environment and the teaching process. In conducting the interviews the following questions are to be answered in order to extrapolate the educators’ conceptions and perspectives:

- What impact, positive and/or negative, has new internet based media technologies had on teachers’ experience?
- What strategies are used to increase the positive effect and decrease the negative impact of the wireless classroom?
- How these strategies are learned, developed and shared among Karlstad municipality teachers.

In performing a phenomenographic analysis of the feedback the following **central** question is to be answered in order to generate a foundation for further research efforts in mapping the progress of teachers’ media literacy;

- What various perspectives and conceptualizations exist among teachers regarding the impact new media technologies have on their experience as educators?

2. Background

The internalization of emerging media technologies by an individual, a culture or an institution is an ongoing process of adaptation. In Karlstad the One-to-One program is a newly initiated approach to education, thus research in the area is only just beginning however; even though large scale One-to-One programs have been initiated since 2001 in the US, Sweden is not too far behind in its research efforts. Many of the research projects surrounding One-to-One projects are only now reaching the phase of meta-analysis and many are still working on creating theoretical frameworks with which can help interpret how laptops are effecting change in learning.

2.1 Related Studies

In their article *The New Learning Ecology of One-to-One Computing Environments* Hiller A. Spires et al. (2011) present their findings in researching what they term as a new teaching ecology that is resulting from the One-to-One programs in North Carolina schools. This new ecology involves a set of new conditions that accompany One-to-One which include constant access to information and
global communities, personalization of learning, student self-direction, self-monitoring and creativity and highly developed teacher capacities. These conditions, which they extrapolated from a number of other research projects involving laptops in schools, contribute to a new type of classroom ecology “which is dynamic rather than static, provides a range of learning contexts for students as technological affordances are leveraged for ongoing learning actions” (Spiral et al., 2011, p. 64). The results of their research found that Ecology 1.0, as they termed the approach, was a viable theoretical framework for re-evaluating existing findings based on new technologies in the classroom. The re-evaluation of existing studies revealed a variety of changes in educational relationships from teacher student to school community as a result of One-to-One programs. These shifts in relationships invariably had implications for teacher preparation including increased communication possibilities as well as more collaborative elements in lesson planning. The research project concluded that Ecology 1.0 and a proposed Ecology 2.0 would provide “a lens for educators to begin understanding the complex conditions and dynamics that take place in one-to-one learning environments” (Spiral et al., 2011, p. 71). It is this kind of long term research which contributes to future projects that I am hoping to achieve.

Mark E. Weston & Alan Bain (2010) provide another approach in their research paper The End of Techno-Critique: The Naked Truth about 1:1 Laptop Initiatives and Educational Change. Weston and Bain performed a comparative research project wherein they related One-to-One initiative to previous educational changes, reforms and innovation programs as a response to “techno-critics” or opponents to the One-to-One initiative. They find that many educational reform programs experience the same phenomenon of gradual failure caused by “the autonomous, idiosyncratic, non-collaborative, and non-differentiated teaching practices that largely remain uninformed by research about what it takes to significantly improve student learning and achievement” (Weston & Bain, 200, p. 8). Interestingly enough, their research concludes that despite falling short of hopes it is possible that “…1:1 initiatives collectively represent heretofore-unattained scale and disturbance in the equilibrium of classrooms and schools (as sited in Dwyer, 2000) and disruption in the educational paradigm (as sited in Christensen et al., 2008). And they may have provided a potential foothold for change and a distinct driver for going further” (Weston & Bain, 2000, p. 9). The article warns that One-to-One programs cannot guarantee improvement merely based on the replacement of one artifact for another and caution against the “belief that educationally beneficial uses of computers will emerge spontaneously from the deployments of laptop computers in ratios of one computer per user” (Weston & Bain, 200, p. 10). The article concludes that One-to-One program should be understood to provide a cognitive tool to the classroom environment and suggest that
taking steps to realize the benefit of cognitive tools, laptop or not, is the path to lasting educational reform.

Research projects around the world are trying to provide insight into the effect of technology integration on classrooms and teachers even if One-to-One is a new development. In *Changing Schools*, Gunilla Jedeskog (2005) offers a broad view of the various phases or waves of ICT implementation that have occurred in Sweden between 1984 and 2004. Each wave is defined by not only the technological landscape of the time but by the steps taken by various government agencies to implement the changes as policy. Jedeskog thoroughly describes each wave in terms of the intentions, conditions, and activities behind the campaigns as well as their results. The overview is particularly relevant to this research project as it contextualized today’s teachers within the process of institutional internalization. It also offers a perspective on how the role of the computer is seen by policy makers throughout time. The initial waves consisted mainly of exposing younger pupils to the new technology in order for them “to be willing and able to influence the use of computers in society” (Skolverket, 1984, p. 10). The second wave resulted in “the use of computers as word processors and as a helpful tool within special education” (Jedeskog, 2005, p. 45). As the collective conception of what computers meant to education was changing, the intention of the third wave in 1994 was “clearly to enhance and speed up the transformation of an industrialized nation into a “knowledge society” (Jedeskog, 2005, p. 59). Jedeskog describes the fourth wave, the ITiS initiative (IT I Skolan) as consisting of seven components with “in-service training for teachers as the main focus” (Jedeskog, 2005, p. 61).

Jedeskog’s report offers a valuable insight into the historical context of emerging media technologies within the last three decades. This research project continues where her research left off, with the fifth wave of ITC integration in schools. Jedeskog concludes that ICT implementation in Swedish schools has by and large been successful but with what she calls “a huge hangover” in the late nineties that slowed the momentum of ICT programs (Jedeskog, 2005, p. 87). With the Dator One-to-One program we see that this hangover has ended and the fifth wave is well underway.

Due to the fact that Dator One-to-One is relatively new policy in Sweden research into the area is limited and the difficulty that many researchers experience is in keeping up with “the rapid expansion of 1 to 1 initiatives or with their breadth” (Penuel, 2005, p. 1). This difficulty highlighted in W.R Penuel’s (2005) study of One to One program research in the United States. Penuel’s analysis indicates that the failure of laptop programs to raise test scores has been attributed to a number of factors, including an insensitivity of current tests to the types of twenty first century learning that laptops are trying to promote. In his analysis Penuel concludes that “the largest
impediment to providing policymakers and program developers with how well 1 to 1 initiatives are working is the design of the studies themselves” (Penuel, 2005, p. 8). This particular observation helped shape the aims of this research project significantly.

The effect of laptop use in schools on test scores is a problematic area of study and as such Mark Warschauer’s two year study, concluded in 2005, aimed at investigating what he calls 21st century learning skills rather than test result. This is particularly relevant in Sweden as the Swedish school system places less emphasis on universal testing and scores than in the US. As Hans Inge Persson (1998) explains in his article Kommunen, skolan och IT, the Swedish educational system has been shifting towards 21st century learning skills for some time. He describes the contribution of IT to the transition, that initially came with the 1994 revision of the National Educational Guidelines towards the new learning skills, as “one of the tools that we could use to teach students to see connections, draw conclusions and participate themselves in the learning process and in doing so become even more active and involved. It also gave us a possibility to make school less predictable” (Groth, 1998, p. 81). Mark Warschauer’s Laptops and Literacy presents his finding regarding One-to-One programs and 21st century learning skills such as Just-in-time learning (processing and applying information on an as-needed basis) individual learning and empirical investigation. His two year study concluded that “…laptop use made it much more feasible for students to engage in research projects and also create better possibilities for in-depth learning” (Warschauer, 2006, p. 103)

As Penuel’s study indicates, quantitative research efforts into the effect of One-to-One programs, such as the effect of the wireless classroom on test scores, struggle with the analysis of new types of learning that laptop use enhance. Research into the so called Fifth Wave of ITC in Sweden’s Educational Institutions needs to be based on well-designed and thorough studies. With this in mind this research project aims to provide preliminary research upon which further research projects can be based.

2.2 Theoretical Framework

This research projects takes a sociocultural approach to learning as its point of departure. Social/cultural theory considers learning a social and communicative process wherein all situations are educational, regardless of their context and that “people cannot avoid learning [trans]” 4 (Alexanderson, 2001, p. 17). This approach to learning supposes that we learn through participation in a social setting. The concept of Learning By Doing, or experiential learning, was introduced by John Dewy in as early as the late 1800’s who saw education as a social process and schools as a

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4 “människor inte kan undvika att lära
social space that concentrated the available resources of society in order that the student might inherit and use for “his own social ends” (Dewey, 1897, p. 9). According to Dewey, the role of the school is to simplify the existing social life of its students therefore, as new social resources emerge, it is the responsibility of the school concentrate and pass on these resources to the student, be they digital or otherwise. As Karlstad Municipality adopts laptops as a part of the everyday life of their students they embrace the role that John Dewey termed “an embryonic community life, active with types of occupations that reflect the life of the larger society” (Dewey, 1915/2009, p.27). Within the framework of this research project it is the educator that is the learner, participating in the One-to-One project based learning of integrating laptops with the classroom.

The emergences of new social resources, such as laptops and smartphones, are central to Social/Cultural theory as they make up a vital part of what social/cultural theorist Lev Vygotsky explains as a “triangular relation between stimulus, response and ‘mediational means’” (Daniels, 2005, p. 181). Vygotsky’s term *mediational means* can be attributed to any physical, intellectual or verbal element that humans use in their interaction with each other or the world. These elements can range from a spoken word that contains meaning to a newspaper or smartphone, simply put; any enabler of interaction. These mediational means are a required element in the transmission of meaning and in being so both mediate as well as contribute to the message being mediated (Säljö, 1994, p. 27). This means that the tools that we depend on to communicate our message to the world also help to form the world in which we communicate, in fact social/cultural theory supposes that communication resources first exist outside the individual before they are internalized. This is significant to this study as the resource in question is only now being included as a part of classroom culture through the One-to-One program opening up the growth and exchange possible through experiential learning.

Roger Säljo explains in his book *Lärandet i Praktiken - Ett sociokulturellt perspektiv* “…we learn simply by paying attention to, describing and reacting to reality in such a way as the environment allows and encourages us to [trans]”⁵ (Säljö, 2000, p. 43). This approach is significant when discussing the integration of emerging media technologies into the classroom for various reasons. Firstly, it acknowledges that the internalization of media technologies is occurring on an ongoing basis and in all contexts. Students come to class with knowledge and experienced gained from hours of online networking and information gathering whether their school is participating in a Dator One-to-One program or not. The same is true for the educator. Teachers are also learning in

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⁵ “Vi lär oss helt enkelt genom att uppmärksamma beskriva och agera i verkligheten på det sätt som omgivningen tillåter och uppmuntrar [oss att göra].”
accordance to the sociocultural model of learning; at home, through discussion with other teacher as well as side by side with their students in the classroom as they instruct. Teachers are forced to adapt to this truth or in some cases figure out how to help students unlearn poor media literacy practices while simultaneously coming to terms with their own understanding of the phenomenon. In *The Internet in School*, Duncan Grey asks the question; “[w]ith the Internet this student has been to every site worth visiting — but what about processing the information found there?” (Grey, 2000, p. 18). Social/Cultural theory provides an appropriate starting point for discussions based on learning in various contexts. Secondly, Social/Cultural theory posits the need to consider *internalization* in the learning process, suggesting that “…every function in the child's cultural development appears twice: first, on the social level, and later on the individual level; first, between people (interpsychological), and then inside the child (intrapsychological)” (Vygotsky, 1978, p. 57). It is this process of internalization that is of interest in this study however, rather than looking at the internalization of media technologies among students, the aim is to focus on the process of internalization among teachers as well as the educational institution. It is of course understood that children have a different learning process than adults when they encounter new stimuli however, the stages and patterns expounded by Social/Cultural theory are useful and similar to McLuhan’s explanation of sensory extension through technology as mentioned above. The questions in the feedback interviews are intended to promote statements about experience, opinions and strategies regarding the use of new media technologies by teachers in order to be able to assess patterns about how media technologies are being internalized by educators within an institution.

2.3 Phenomenographic method

Research data collected through a series of open ended standardized interviews will undergo phenomenographic analysis. The choice of standardized open-ended interviews was both motivated as well guided by one of the condition of a phenomenographic approach to analysis; that informants are able to reveal unforeseen perspectives while simultaneously keeping a focus on the phenomenon in question. Phenomenography offers a method to qualitative analysis of interview transcripts whose “…roots […] are to be found in studies in learning” (Bowden, 200, p. 1) and was therefore applicable to the phenomenon being researched by this project. F Marton’s (1986) popular explanation of phenomenography describes it as a “research method adapted for mapping the qualitatively different ways in which people experience, conceptualize, perceive, and understand various aspects of, and phenomena in, the world around them” (p. 31).

A phenomenographic analysis of data consists of discovering sets of categories from transcribed interview material. Through phenomenographic analysis the researcher endeavors to identify how
different interviewees see a phenomenon, by reading and rereading the transcripts, usually in research groups, for similar ideas expressed in different terms. Focus is on basic principles and features that characterize group of concepts as well as elements that distinguish one group from another. These categories are further analyzed for subgroups of perspectives to reveal various concepts regarding the phenomenon.

At this point certain distinction should be made about to what degree this research project can be considered phenomenographic. It should be understood that this is not a phenomenographic study but rather it has used a phenomenographic method in its analysis of data. It may seem a subtle distinction but it is a distinction none the less. Bowden makes the distinction between what he calls developmental and pure phenomenology. Developmental phenomenology aims to discover the different ways in which a group experiences a phenomenon in order to help effect a change on the perception, whereas this study would fall into the category of non-developmental or ‘pure’ phenomenography wherein the “ultimate goal is to develop full descriptions of the range of ways of experiencing that phenomenon, with no intention of using those outcomes to effect change” (Bowden, 2000, p. 15).

3 Method
In conducting his meta-analysis of information John Hattie did not merely set about analyzing all available data but rather he “built a model based on the theme of “visible learning, visible teaching” (Hattie, 2009, p. 237). The purpose of this research project is to analyze feedback from educators in such a way that may provide future researchers with such a theme. The project was essentially carried out in two parts; the initial phase that includes the accumulation of feedback from Karlstad area teachers regarding the phenomenon through interviews; the second phase of the project wherein the transcribed interviews were analyzed. This research project applied a non-developmental phenomenographic approach to the analysis of standardized open ended research interviews in order to collect preliminary data regarding how Karlstad area High School teachers experience and conceptualize the effect of new media technologies on their experience as educators.

The reason behind the choice of phenomenographic method was in part due to the overall size of the phenomenon as well as the projects overall purpose. It has been my intention from the conception of this project to try and create a broad enough area of feedback from which to extrapolate conceptions on which to base future research. Phenomenographic analysis allows for a broad array of informants to be interviewed in an open ended and flexible environment without having to exclude perspectives. The phenomenographic method “decontextualizes human actions (and talk) from the concrete practice that triggers them” (Säljö, 1994, p.31) which allows for a
broader scope of feedback to be analyzed. The threat of such a broad analysis is in asking a narrow selection of questions which would mediate the reality of the feedback. In conducting open ended interviews and using phenomenographic method I had hope to allow for the conceptions of the informants to reveal themselves in order for future research to be untainted expectations.

3.1 Data Collection

Early in the planning phase of this project focus group interviews were considered as method for data collection. The motivation for this was that given the short amount of time and limited size of the research team, it would be easier to gather more data if a series of group interviews were conducted. However, experience in the field with focus group interviews revealed that certain individuals who were more aggressive or outspoken tended to express their perspectives about the phenomenon in such a way that monopolized or restricted the other informants. This was likely the result of inexperience on the part of the researcher but nevertheless resulted in an environment that limited discussion in favor of one perspective over another. In order to achieve the aims of this research project, the discovery and categorization of various perspectives, a different approach to data collection was decided upon; standardized open-ended one-on-one interviews. This method of data collection, the researcher hoped, would create an interview environment favorable the free and flexible discussion of individual experiences relating to the research phenomenon. Though this methodological approach retains a degree of focus on the research phenomenon through standardized questions, it also gives the informant the freedom to focus on the aspects of their experiences that were most relevant to revealing their conceptions. John Hattie’s feedback model aims to three major feedback questions that I inspired the interview sessions; where am I going? how am I going? and where to next (Hattie, 2007, p. 102).

3.2 Population and selection

The population for this research study can be defined as any teacher who has experienced the integration of new media technologies in the classroom. However, in order to maximize the range of perspectives among informants who still have similar experiences with the phenomenon, the following selection criteria were determined (Bowden, 2000):

- Informants were to be selected from teachers of High School level students (gymnasiet).
- Informants were to be selected that work within Karlstad municipality.
- Informants should be teachers of the same subject, English.
- Informants should come from a variety of school types in various stages of One-to-One program.
The criteria were determined in order to assure that the informants shared similar experiences but that their interviews would also provide a broad spectrum of perspectives from which to observe and determine various categories that result in the phenomenographical model of ‘conceptions’ of a phenomenon. The various criteria insured that informants had similar experiences when it came to the age and relative maturity of their students, similar subject matter and goals to work with as well comparative work environments when it came to municipal policy.

The final selection of informants consisted of:

- A total of 8 English teachers working within Karlstad municipality at High School level.
- 2 male, 6 female between the ages of 34 and 54.
- Half of the informants work at privately owned schools, the other half at municipally owned schools.
- Four of the informants work at schools that had adopted the One-to-One program Fall 2011, two informants work at a school in which the Dator One-to-One has been implemented for a number of years and two informants work in schools that are still in the planning stages of One-to-One and haven’t adopted the practices as of yet.

3.3 Methodology

The open ended standardized interviews were conducted during November and December of 2011 and lasted between 15 to 45 minutes. The data collection process involved first contacting potential informants via group email that explained the purpose and scope of the study. A potential informant list was created by first contacting the school principals for information on any teachers that may be interested in participating in the study; I then checked the various school websites for team leaders who may also be able to suggest informants. Finally, I sent e-mails to any other English teacher that was listed on the web sites. I had hoped to gather a variety of highly willing to less willing informants in order to have a broad variety of perspectives included in the feedback.

After initial contact each potential informant was then contacted by follow up personal email for scheduling and finally by telephone when necessary in order to arrange a meeting.

Finally, each informant was met at their place of employment and the interviews were conducted in the location of the informants choosing as well as at their convenience. I tried to suggest an interview location that was comfortable and familiar to each informant where we would not be interrupted and would have the time we needed to conduct a full interview.

The interview process was conducted as follows:
Before official data collection began the interviewer:

- Gave a summary of the aims and purpose of the project
- Explained that the data collection process was to be a digital recording on to a laptop via one external directional microphone as well as a backup internal microphone.
- Described the extent of anonymity where informants would be represented solely as letters in later transcriptions.
- Briefly defined the parameters of the interview process as open ended to encourage discussion.

Each informant was asked the same basic set of questions throughout the interview though the interviewer made allocations for the introduction of new topics within the area of research. The basic set of questions did change slightly during the process as informants introduced areas of the phenomenon relevant to research.

The researcher originally had five open ended interview questions that were intended to initiate discussions regarding their experiences with new media technologies in the classroom while a sixth question was added after the second interview which concerned the concept of literacy. The interview questions were meant to reveal various experiences, strategies and opinions regarding the research phenomenon that would later be analyzed for similar categories among the informants.

3.4 Operationalization of interview questions

John Hattie (2007) explains that his model “discriminates between four levels of feedback: the task, the processing, the regulatory and the self” (p.102). It was hoped that the interview questions would address these various areas of feedback in order to promote a wide variety of responses from which to construct conception on which themes future research could be based.

The interview questions and the rationale behind them were as follows:

1. **What experience do you have with the integration of the internet in the classroom?**
   - Initiating discussion with a descriptive question.
   - This inquiry is simply a description of the informant’s work environment, past and present.
   - The response is a statement of fact which means there is no right or wrong answer and as such will create a favorable interview environment.
   - The initial attitude towards the phenomenon should be revealed as the informant’s interest in media technology will be reflected. I.e. have they initiated internet based learning independently or due to policy?
2. What positive/negative effects have you noticed as a result of internet in the classroom?
   o With this structural inquiry the researcher leaves it up to the informant as to whether to begin with the positive or negative effects which will serve as a phenomenographic category.
   o The ration between positive and negative utterances will serve as a category marker.

3. Have you any strategies to increase the positive influence and/or decrease the negative effects of the internet in the class?
   o The informant’s strategic approach will be considered i.e. whether it is proactive or reactive, based on limiting or improving the use of the media technology as a teaching tool, etc.
   o The negative and positive expressions can be considered as category markers.

4. What potential do you see the internet has to offer? Is there anything that you would like to use it for in the future?
   o The response to this inquiry will show what the informant sees as influencing factors when it comes to the phenomenon.
   o This question is intended to continued discussion regarding the general opinion the informant has towards the phenomenon and open the discussion in general.
   o Discussion initiated by these questions will indicate whether or not the informant has internalized the phenomenon as a part of their planning.

5. Do you think that the integration of the internet with the classroom will increase or decrease?
   o The answer to this question is obviously the former but the manner in which the informant expresses the obvious, as positive of negative, will be comparatively relevant.

6. Added question: What effect do you think the internet is having on your students’ literacy?
   o After the first two interviews the notion of literacy was already a central discussion point however it was not well defined and a distinction between academic literacy and digital literacy was lacking.
   o This question was added to promote a more specific discussion about how the informant sees their role in both sorts of literacy and whether they had considered them separately.
The interview questions were designed to be as neutral and open ended as possible in order to promote the informant’s own perspective regarding the phenomenon. The responses were recorded onto a laptop using an external multi directional microphone as primary input as well as the computer’s internal microphone as a secondary backup. The interview data was then transcribed verbatim which resulted in a 17 505 words or 43 pages of transcribed interview notes.

4. Results

4.1 Analysis of Data

The transcribed material then underwent phenomenographic analysis of the informants’ discussions of experiences, strategies and opinions in order to discover perspectives, attitudes and approaches that, when categorized; reveal various ‘conceptions’ of a phenomenon As described above, the process itself consists of thoroughly reading through the transcribed material in order to perform a qualitative analysis. The phenomenographic method of analysis of the collected interview transcript material began with a preliminary category selection based on relevance (see appendix for analytical process). The discovery of this initial group of utterances was the result of going over the transcriptions in search of references of interest in relation to new media technologies in any context. Any utterances that seemed of interest were set aside and added to the “data pool”. After reading and rereading the transcripts the initial data pool was comprised of a total of 269 quotes taken from the 8 interviews. The data pool was then divided into categories by comparing the utterances to each other and looking for similarities. The process involves reading through the data pool a number of times until similarities present themselves. Through this process the data pool was eventually divided into 3 groups or categories based on thematic similarities among the utterances.

The following preliminary categories are based on the criteria of relevance and determined by similarities:

1. Experience of Phenomenon by Comparison/Relation: the informants often expressed their experience of new media technologies as some sort of comparative relationship.

   Example:
   a. compared to how it was before, as in “så att informationsökning per internet handlar mycket om att man inte går iväg till biblioteket”
   b. how they have experienced a change: ”eleverna tyckte att det var lite knepigt först men i början går vi bara igenom det och går ju jättesnabbt”
   c. experienced as a difference in their role as a result of the phenomenon: “jag har inte själv testat det. Borde jag ha gjort kanske”
2. Teaching Strategies in relation to Phenomenon: quotes were collected that addressed the issue of strategies in approaching the phenomenon in the school environment.  
   Example:
   a. Adopted in class strategies: "Det här att jag ber dem att inte använda datorer om vi just jobbar med ett moment där inte finns någon anledning till att de ska ha datorer ber jag dem helt enkelt att stänga locket på laptopen”
   b. Experienced as non action: "Jag har inte riktigt ändrat undervisningsätt så mycket än.”
   c. Out of class strategies:”Google Apps har ju också en sådan funktion där du faktiskt kan se vad som är stulet från Internet.”

3. Phenomenon in Application: quotes were selected that referred to the application of media technologies in various contexts.
   Example:
   a. Frequency of phenomenon occurrence: “Nu har alla egen [dator] ... och jag har ett årskurs-ett-gäng i engelska ... så vi använder dem ibland ... inte alltid ...”
   b. Manner in which the phenomenon is applied in the class: ”Vi har projektor i klassrummet så kopplar jag alltid in min dator.”
   c. Phenomenon experienced in other contexts : ”Google docs har jag jobbat med och det har jag faktiskt infört i arbetslaget för några veckor sedan.”

4.2 Categories
   Once the primary categories were discovered, the utterances were abstracted, taken out of their interview context, and put in a new context of category based on similarity. The next phase of the phenomenographic analysis was to determine sub categories based on differences within the categories. The discovery of sub categories occurred in a similar fashion as the primary categories whereas the reading and rereading of each category of utterances revealed what Bowden calls “core meaning” as well “borderline cases”. The difference between the core meanings and the borderline cases is the source of discovering the sub categories. The small differences in how the informants experienced the same aspect of the phenomenon would eventually serve to indicate the various elements of structure within the informant’s conceptions without validating one degree of the characteristic above another. It is pretty interesting actually. The sub categories are presented in sets of core meaning / borderline cases.
The conceptions or reduced categories of description are expressed here as 3 primary categories and 6 sub categories made up of sets of core meaning / borderline cases that emerged through a phenomenographic method of analysis.

1. Experience of Phenomenon by Comparison/Relation:
   a. Integration/Separation: this set of sub categories emerged as informants expressed the experience of integrating new media technologies in terms that are positive or negative:
      i. ”Det tycker jag faktiskt är så himla skönt och då kan man göra nästan vad som helst ... alltså då kan man använda datorn till precis vad du ville ... för det är basen.”
      ii. ”Jag är positiv men samtidigt så känner jag också att vi inte får tappa kontrollen ... det får vi inte göra”
   b. Institutional/Personal: this set of sub categories emerged as relative or comparative utterances regarding the phenomenon reflect the informant’s experience of the changes in the educational institution on the one hand and the personal changes they underwent as a result of emerging media technologies in their daily life, on the other:
      i. “Ju fler som använder datorer, desto fler kommer med tips om hur vi kan använda dem. Men det gäller att vi tar till oss det här och försöker hitta nya metoder att använda i klassrummet.”
      ii. ”Många rektorer tänker bara att om bara alla får egen dator i så löser allting.”

2. Teaching Strategies in relation to research phenomenon:
   a. Restrict / efficiency: informants expressed their strategies in dealing with new media technologies in varying degrees of either restricting access to the internet or tactics which somehow improve efficiency in using the media technology as a tool:
      i. ”Nej jag förbjuder inget sån’t så länge de håller sin deadline”
      ii. ”Så jag kan stänga av dem från skolansinternet men om de har en smart telefon i fickan då så är dem där i alla fall ... och så fort jag inte har någon vän in närheten så är jag ute på Facebook eller ...”
   b. Digital literacy / Academic literacy: the informants teaching strategies served various purposes and, while all were teaching English, the skills associated with their experience teaching within wireless classroom ranged from traditional academic literacy to digital media traditionally unassociated with English lessons:
"Så här finns många möjligheter … det är ju bara för oss lärare … så får man utbildning på IT så handlar det mer om att hantera själva apparaten och mer sällan om man kan utveckla lektionerna med hjälp av denna nya teknik.”

"Det eleverna måste lära sig är att hantera sin integritet … det samma på Facebook … man kan inte dela allt med alla … det måste man lära sig … och att inte dela alla dokument heller …”

3. **Phenomenon in Application**
   a. **Discourage / Encourage internalization:** in describing how practical application of emerging media technologies informants either encouraged the internalization of the research phenomenon or subtly discouraged it:
      i. “Då skapade jag Facebook grupper för alla klasser men då är den en avgränsad klass ... jag skapade en grupp ... ingen annan kommer in där ... jag kommer inte åt elevernas privata profil och de kommer inte åt min utan vi har ett eget universum i denna grupp.”
      ii. ”Hur kan jag använda datorn på mina engelskalektioner? Där finns det inte särskilt många speciella program ...”
   b. **Teacher centered / Student centered:** the process of adapting to new media technologies of today lead to discussions that focused on both student centered as well as teacher centered practices:
      i. “Nu har vi det, men förra året så hade vi inte projektor mer än i bara vissa klassrum. Nu har vi projektorer i alla klassrum i den här byggnaden. Så nu kan jag använda datorn hela tiden.”
      ii. ”Annars baserar jag väldigt mycket på Internet ... för att det känns relevant och det blir ett autentiskt material, och det upplever jag att eleverna känner också att skolboksmaterial inte riktigt är på riktigt för eleverna … då blir det väldigt mycket skolengelska.”

6. **Discussion**

6.1 **Conceptions for further study**
The purpose of applying a phenomenographic method is to produce descriptions of reality through the analysis of the relation between individuals and the phenomenon. The reason behind this project is to produce such a description upon which further research could be based. It is my hope that the descriptions of the structural elements that have been discovered can serve as both a point of reference and starting point in planning a future research project.

The structure of future research projects as well as areas of inquiry and interview questions can be aided by focusing upon the following categories and sub categories of description:

1. Experience of Phenomenon by Comparison/Relation
   a. Integration/Separation
   b. Institutional/Personal
2. Teaching Strategies in relation to research phenomenon:
   a. Restriction / efficiency
   b. Digital literacy / Academic literacy
3. Phenomenon in Application
   a. Discourage / Encourage
   b. Teacher centered / Student centered

It should be pointed out that the analysis of data used a phenomenographic method rather than approach, the research itself was based on Social/Cultural theory. The process of phenomenography endeavors to decontextualize utterances whereas it is my understanding that learning dependent on a social context, these two concepts by no means contradict one another.

6.1 Reliability:
Unfortunately, phenomenology and reliability are often at odds with one another and the methodology has received its fair share of critic as a less than reliable approach, especially when carried out by inexperienced researchers such as myself. The central criterion of reliability is whether or not the results could be replicated under the same circumstances. I like to think that my research methods, if repeated from stage to stage, from the formulation of the research questions, through selection of informants, interview and analysis to the reduction of the data to categories of description are thorough enough that the replication is likely. I do see some problem areas however that could call the reliability of this research project into question. From my own experience with phenomenography, I feel that the discovery of categories could be replicated. The process was very involved and laborious but it is through the sheer amount of time that one spends with the material that the categories emerge. There is a debate regarding constructing rather than discovering.
categories which Elenor Walsh (2000) takes up in her article *Phenomenographic Analysis of Interview Transcripts* where she points out that phenomenographic researchers “aim specifically to discover categories from the data, not to analyze [it] in terms of predetermined classifications.” (p. 21) and from my experience I feel that this is a valid distinction. The threat of constructing categories is real, I don’t argue that but if the process is not rushed the categories’ are indeed discoveries; they jump off of the paper (after enough time has passed). I have to admit however that one researcher analyzing a transcript is insufficient. There were moments when I would have liked to argue the case for or against certain utterances and where they belonged. So in that respect I did not do the reputation of the methodology, nor the reliability of my research any favors.

6.2 Validity:

Though I did strive to follow the basic guidelines research methodology, I came to some conclusions while the process was already underway that give me reason to critic my own validity. The main problem as I see it is with selection of informants. I was initially very pleased with how I went about choosing my informants. I had managed to “maximize the range of perspectives among informants who still have similar experiences with the phenomenon”, as Bowden suggests, by choosing informants from a relatively narrow demographic (as discussed above). I realized however, that the manner in which I initiated contact with potential interviewees was email, not the phone, which could create a bias among interview subjects. I started to consider this when I noticed how quickly some of my interviewees answered their correspondence which meant one thing; they were interested in media technology. This may have skewed my results to some extent.

The basic set of interview questions did change slightly during the process as informants introduced areas of the phenomenon relevant to research, specifically literacy. In the first two interviews we were discussing digital literacy, which was inevitable given the area of research. I felt that a distinction should be made between the academic and digital literacy to see if the interviewees would take up the gauntlet and answer the question as though it were comparative but in the end that never occurred. The discussion about literacy seemed forced and I had changed my format for no reason, which I regretted, though ignoring the trend was not an option.

6.3 Conclusion:

I would like to begin my discussion of this research project with two words: Docendo discimus. Through the course of this research project, these two words, Latin for *by teaching, we learn*, have popped into my head countless times. During interviews and transcription, while reading and re-reading the data, I couldn’t help but think of the theoretical framework that this research project is
based upon. Social/Cultural theory’s central tenant that all situations are learning situations was all too relevant when discussing these rapidly emerging new media technologies that are my informants struggle with each day. In adapting to the needs of their students the teachers themselves learned and continued to learn how to come to terms with the emerging media technologies of today. I had interpreted the aims and purpose of this research project as educational as I had intended it to be a collection of research information that others could learn from and put to use in research of their own, driving our understanding further. Everywhere I turned I saw teaching and learning occurring simultaneously, inexorably intertwined, the process and result one and the same. The act of performing the research I learned a few things that I would do again as well as some things that I would do differently next time.

In closing I would like to say that I had approached this research project with apprehension. I was worried that my own inexperience with research method would result in invalid conclusions. During the method course that lead up to the final research project my own errors in method often resulted in faulty results and what felt like wasted effort and time. In general I have a hard time performing a task for the sake of it and I approached this project in such a way that the results would not be easy to dismiss. The scope of my study and its aims were modest enough that I felt that they could be taken seriously even though it was what it was. Though I have learned through error once again, as my concerns with reliability and validity indicate, I feel comfortable in presenting my findings to the academic community to be considered or use in further research. I have worked hard to focus my efforts on an area, an approach and a method that does not stand alone as a required element towards a degree but rather part of the ongoing process that is our understanding of media technology and its effect on the education of our children. I have performed this research and subsequent analysis in order to provide information yet in presenting this project I reveal what I have learned; Docendo discimus.

6.4 Further Research:
Research into media technology as a teaching tool creates something of a paradox. Gunilla Jedeskog explains that “[i]formation technology is expected to be a means to fulfill this goal [of students managing their own learning] and at the same time the use of ICT may be regarded as one of the reasons for this goal” (Jedeskog, 2005, p. 11). This paradox, coupled with the accelerated rate of technological advancements we experience in our society, is changing the structure of the classroom. Future research needs to build upon real experiences in the classroom. The danger in struggling to keep up with technology is in anticipation the problems rather than basing research on existing issues and future research should be undertaken with this in mind. Phenomenographic
research projects such as this can provide a foundation based in what is actually experienced by real people. From a sociocultural perspective I believe similar research into how media technologies are being internalized by teachers and students, both inside as well as outside the classroom, should be conducted upon which the understanding of the phenomenon can be seen in the broader context.

The situation in Karlstad municipality offers the possibility of ongoing research that monitors the internalization of new media technologies over time based on the categories of description that this research provided.
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