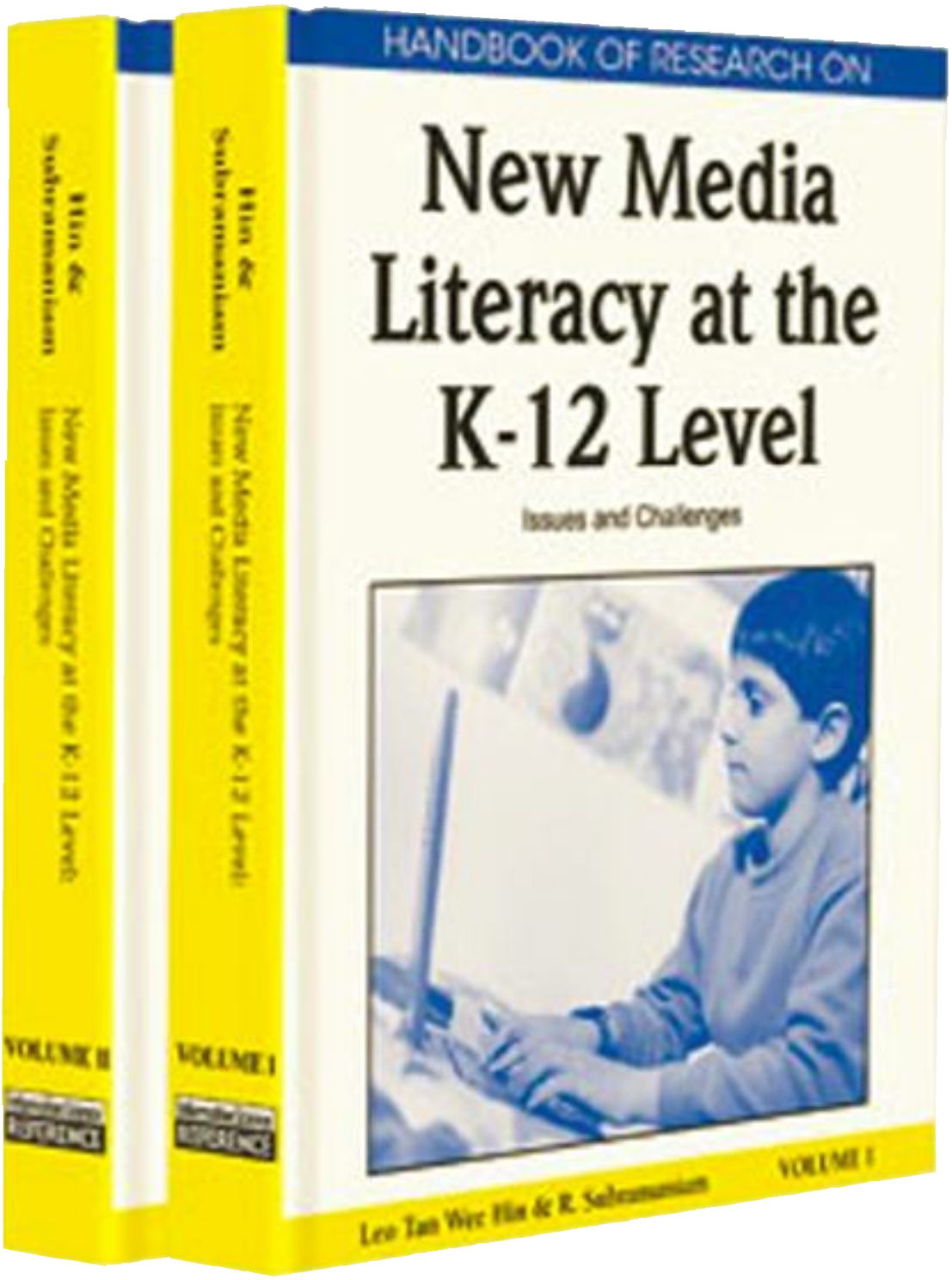
HANDBOOK OF RESEARCH ON
New Media Literacy at the K-12 Level
Issues and Challenges
Leo Tan Wee Hin & R. Subramaniam
VOLUME I

Handbook of Research on New Media Literacy at the K-12 Level:
Issues and Challenges

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Volume I

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Preface xxix

Section I
Issues in New Media Literacy

The new media represents an assortment of ICT tools that span a wide spectrum of uses. Each of these technologies comes with its own unique characteristics to support learning in specific contexts. This section address issues and concerns that surround the use of new media in educational settings and notes how the definition of new media literacy has not been static but has been evolving with the myriad of applications that have come on board with the fructification of research in educational settings. More importantly, the social dimension that it engenders has implications for tapping the preferred learning styles of the digital natives.

Chapter I
Learning for the Future: Emerging Technologies and Social Participation 1
Guy Merchant, Sheffield Hallam University, UK

The author discusses how digital literacies that are germane to evolving forms of social practice in today's society can be incorporated into classroom practice. With the affordability of digital connections, the Web 2.0 environment presents a platform to jump-start social participation and knowledge creation by students. The challenge is to see how communicative and collaborative frameworks can be juxtaposed with new insights into learning so that the potential of these new technologies can be capitalized effectively to promote learning.

Chapter II
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Kevin M. Ayres, The University of Georgia, USA
John Langone, The University of Georgia, USA
Karen Douglas, The University of Georgia, USA

Digital literacy skills have been framed by keeping in mind the needs of normal students. With technology being an enabling tool, students with developmental disabilities can now interact with electronic

text to make greater meaning of the world around them. In this context, the authors argue for the need for the definition of digital literacy skills to evolve so that the special needs of such students can also be taken care of.

Chapter III

Pedagogic Potentials of Multimodal Literacy 32
Maureen Walsh, ACU National, Australia

The transformation of the literacy landscape from one based on traditional text to one based on a range of ICT literacies is heralding a paradigm shift in the way students learn. Reconfiguring pedagogy to meet multimodal literacy needs affords opportunities for producing students who are well equipped to thrive in the new educational milieu. The author explores this standpoint further and also reports on a study in which the pedagogy of literacy in e-learning and multimodal classroom environments was redesigned for classroom practice.

Chapter IV

Pedagogical Mashup: Gen Y, Social Media, and Learning in the Digital Age 48
Derek E. Baird, Yahoo!, Inc., USA
Mercedes Fisher, Milwaukee Applied Technical College, USA

The digital culture in which students in today's society are immersed provides immense scope for leveraging on a medley of tools to enhance their learning experiences in the classroom. These new media afford a platform for the students to explore learning based on interactions with others and developing ideas by active engagement, both of which capitalize on their innate need to be part of a community. The authors emphasize the need for instructors to be cognizant of social trends promoted by the new media and reiterate that these need to be integrated into the curriculum so as to tap on the preferred learning styles of the digital natives.

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Jörg Müller, Universitat Oberta de Catalunya, Spain
Juana M. Sancho, University of Barcelona, Spain
Fernando Hernández, University of Barcelona, Spain

This various forms of new media that have come upstream in society have exacerbated the divisions between those who are ICT-literate and those who are disenfranchised from reaping their full benefits. These equity issues raise several concerns which the authors explore from various perspectives. They advance suggestions for bridging this binary divide and emphasize on the importance of school initiatives and other intervention strategies for implementing educational projects that are not only sustainable but are also inclusive so that no student is left behind.

Chapter VI

Teaching and Technology: Issues, Caution and Concerns 89
Thomas G. Ryan, Nipissing University, Canada

The all-encompassing nature of technology in today's society means that it is a change agent, an educational tool and an empowering medium. In this chapter, the author flags off some concerns for consideration when technology is used in teaching. He reiterates the message that teaching is very much an individual odyssey and that there is a need for teachers to be mindful of their role through introspection, values clarification and action research so that technology is subservient to the thrust of the educational mission.

Chapter VII

The Information and Communication Technology (ICT) Competence of the Young 101
Liisa Ilomäki, University of Helsinki, Finland
Marja Kankaanranta, University of Jyväskyla, Finland

The extent to which strategic initiatives and implementation efforts in Finland have contributed to the ICT competencies of the younger generation is explored in this chapter. It is shown that ICT competencies and attitudes are honed mainly by home resources and leisure time pursuits. Gender differences among the young as well as skills differences between the youngsters and adults in relation to ICT usage are also considered.

Chapter VIII

An Interactive and Digital Media Literacy Framework for the 21st Century..... 119
Wei-Ying Lim, Nanyang Technological University, Singapore
David Hung, Nanyang Technological University, Singapore
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Interactive and digital media (IDM) literacy encompasses four aspects: media literacy, technological literacy, social and civic responsibility, and imagination and creativity. The authors advance the need for these competencies to be grounded in school practice so that students are well prepared to face the challenges of the new economy. Recommendations are given for policy makers and stake holders to promote a culture that is supportive of IDM as well as catalyzes the growth of an industry around it.

Chapter IX

Promoting Mediated Collaborative Inquiry in Primary and Secondary Science Settings:
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Michael A. Evans, Virginia Tech, USA

The author emphasizes that science-based collaborative inquiry mediated within a community of practice needs to be an important goal for the 21st century classroom. Leveraging on the ubiquity of communication channels promoted by wireless and mobile devices and supported by social software, he draws on the results of two studies done in geographically dispersed settings to show that effective learning is possible in a real world context. The challenge is to see how traditional modes of pedagogy can be tweaked to support such learning.

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Tamar Levin, Tel Aviv University, Israel

The author draws on the results of two longitudinal studies to study the links between teachers' educational beliefs and their use of ICT in pedagogy. It is shown that extensive use of ICT over the years has, in fact, coloured teachers' beliefs so much so that they now tend to look at issues from multiple perspectives. The study also shows that the mindset change of teachers is dictated by a number of factors – the kind of ICT tools available in the classroom, the experiential nature of the learning environment, and exposure to new ideas.

Chapter XI

Effective Characteristics of Learning Multimedia 167
Piret Luik, University of Tartu, Estonia

The diversity of educational software that are commercially available for bringing multimedia to the educational setting poses issues with respect to selectivity and utility for target audiences. Drawing on the experiences from two experiments involving multimedia textbooks and multimedia drills, the author stresses on the need for a robust design framework for multimedia that takes into consideration the differential learning needs of both genders. He offers recommendations and guidelines for developers of multimedia software to bring effective learning to students.

Chapter XII

Empowerment Rationale for New Media Literacy 189
Nancy J. Hadley, Angelo State University, USA

The emergence of new genres of ICT literacy and their nexus with education has necessitated the need for curriculum design to be redefined so as to promote desired outcomes in the learning process in the digital age. In this chapter, it has been suggested that curricula which promote empowerment can help to develop students who are confident in their ability to come up with solutions to problems. With the proliferation of user content in sites such as YouTube and MySpace and these spawning a unique culture, a case has been put forward on the need for a high level of digital literacy skills among citizens.

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Using Technology in Pedagogically Responsive Ways to Support Literacy Learners 203
Lisa Kervin, University of Wollongong, Australia
Jessica Mantei, University of Wollongong, Australia
Jan Herrington, Murdoch University, Australia

The chapter makes a strong case for technology to be embedded in practice rather than be treated as an adornment if its potential in the classroom is to be realized more effectively. This can be accomplished when teachers develop educational experiences that leverage on authentic learning contexts within the framework of the curricula. Learning tasks that buttress the connections between technology use, literacy and learning are also shown to be effective in this regard.

Chapter XIV

Scaffolding Problem-Solving and Inquiry: From Instructional Design to a "Bridge Model" 216
Zvia Fund, Bar-Ilan University, Israel

In this chapter, a problem-solving and inquiry-based approach was used to investigate science learning among junior high school students. Support models for instruction were based on four components – structural, reflective, subject content and enrichment. The results were used to formulate a theoretical framework called the bridge model, which was able to explain the operation and role of the respective components.

Chapter XV
Reconceptualising Scaffolding for New Media Contexts 243
Nicola Yelland, The Hong Kong Institute of Education, Hong Kong
Jennifer Masters, La Trobe University, Australia

The diffusion of information and communication technologies in the educational space has provided not only opportunities for teachers to harness these for teaching but also presents challenges for their effective use. In this chapter, an argument is advanced that effective scaffolding techniques are imperative if student learning outcomes are to be enhanced in a topic. The need for teachers to be conversant with various scaffolding pedagogies in teaching practice is underscored by way of two examples.

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Yufeng Qian, St. Thomas University, USA

3-D environments are media-rich and technologically intensive platforms for teaching and learning. A number of model 3-D virtual learning programs which promote experiential learning are examined in this chapter. The author makes a strong case for new media literacy frameworks to be reconceptualized so as to take on board the unique needs of such environments.

Chapter XVII
The Factors Affecting Multimedia-Based Inquiry 270
Margus Pedaste, University of Tartu, Estonia
Tago Sarapuu, University of Tartu, Estonia

Inquiry environments based on multimedia are a strong contender to traditional formats when it comes to scaffolding learning among students. For such environments to maximize their efficacy, it is imperative that design considerations be given adequate attention when configuring their delivery format. In particular, the authors stress on the importance of three factors – cognitive load of the problems, sequencing of the problems and profiles of the end users.

Section II
ICT Tools

The assortment of ICT tools available for use in teaching and learning is formidable! Some of these include video games, wikis, blogs, talking books, WebQuests, mobile devices, PowerPoint – the list goes on! Each of these tools has evolved into specific genres in the taxonomy of e-learning. The chapters in this section explore the utility of these and other tools to promote literacy.

Chapter XVIII
Using Video Games to Improve Literacy Levels of Males 286
Stephenie Hewett, The Citadel, USA

Whilst traditional literacy skills among males have declined globally, their penchant for video games has allowed them to move up the ladder in digital literacy skills. The interactivity that such games foster provides the necessary support for males to learn effectively in game-based learning environments. The chapter makes a case for teachers to embed video games in context in the school curriculum.

Chapter XIX
Engagement in Science and New Media Literacy 300
Andrea J. Harmer, Kutztown University and Lehigh University, USA

An activity on environmental pollution in which inquiry elements are embedded contextually and which capitalizes on the tools of new media is described in this chapter. This activity, done in a real world setting and which also entailed collaborative video conferencing with experts, promoted positive learning experiences among students. A case is made by the author that such activities promote effective learner engagement while imbuing them with literacies in new media in authentic contexts.

Chapter XX
Web 2.0 Technologies and Science Education 310
Thiam Seng Koh, Nanyang Technological University, Singapore
Kim Chwee Daniel Tan, Nanyang Technological University, Singapore

The potential of Web 2.0 technologies to impact on science education and thus enhance science literacy is tremendous. In this chapter, the authors discuss applications of such technologies for classroom practice in science. They advance the point of view that a framework based on social constructivism mapped on Web 2.0 technology environments could promote a rethink on pedagogy and assessment in relation to teaching and learning of science.

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Measuring and Evaluating ICT Use: Developing an Instrument
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Romina Jamieson-Proctor, University of Southern Queensland, Australia
Glenn Finger, Griffith University, Australia

Whilst the diffusion of ICT in the classroom to support teaching and learning has seen great strides in recent years, there is the question of whether the financial outlays and policy measures that support such initiatives have promoted the desired outcomes in the learning process. In this context, the design and development of an instrument to measure the effectiveness of student use of ICT, as judged from the lens of teachers' views, is explored. The results from the administering of this instrument on two schools in Queensland reiterate the point that stakeholders need to know regularly whether investments in ICT use for teaching and learning are translating into effective learning gains for students.

Chapter XXII
Using Talking Books to Support Early Reading Development 340
Clare Wood, Coventry University, UK
Karen Littleton, University of Jyväskylä, Finland
Pav Chera, Sutherland Institute, UK

Promoting literacy among beginning readers through the use of 'books which talk' is the subject of this chapter. The interactive format and multimedia feature of talking books are factors which appeal to early readers. In particular, the effectiveness of a specific talking book in fostering reading-related skills and abilities is evaluated and, based on this, guidelines are offered for software developers to bear in mind when working at the child-computer interface.

Chapter XXIII
Web 2.0 Technologies as Cognitive Tools of the New Media Age 353
Yu-Chang Hsu, The Pennsylvania State University, USA
Yu-Hui Ching, The Pennsylvania State University, USA
Barbara Grabowski, The Pennsylvania State University, USA

This chapter focuses on the use of Web 2.0 technologies such as folksonomy, wikis and weblogging to support pedagogical practice. It is shown that the introduction of these diverse tools into teaching and learning can support metacognitve activity and self regulation among learners. Some recommendations on the implementation of Web 2.0 technologies with respect to instructional possibilities are given.

Chapter XXIV
Implementing Collaborative Problem-Based Learning with Web 2.0 372
Steven C. Mills, The University Center of Southern Oklahoma, USA

The emergence of Web 2.0 technologies presents a plethora of opportunities for teachers to engage students in meaningful learning contexts. In this chapter, the author describes how tool kits and information resources for communication based on such technologies can be overlaid on instructional methodologies in the K-12 setting to promote effective learning. In particular, when these are used in collaborative and problem-solving modes, there is tremendous scope for providing rich learning experiences for students.

Chapter XXV
Using Online Tools to Support Technology Integration in Education 389
Jo Tondeur, Ghent University, Belgium
Arno Coenders, Stichting Kennisnet, Netherlands
Johan van Braak, Ghent University, Belgium
Alfons ten Brummelhuis, Stichting Kennisnet, Netherlands
Ruben Vanderlinde, Ghent University, Belgium

Integrating ICT into educational settings is more than just supplying computers and linking these to the Internet. The effectiveness of such integration can be better assessed by the availability of suitable

metrics. In this chapter, the authors address the use of online tools that can gauge performance across three fronts: current use of ICT in school, teachers' knowledge and skill levels with respect to the school vision, and ICT planning.

Chapter XXVI

Developing Digital Literacy Skills with WebQuests and Web Inquiry Projects..... 403
Susan Gibson, University of Alberta, Canada

ICT skills necessary for the 21st century can be promoted more effectively amongst students if the pedagogical delivery framework can be tweaked to facilitate their acquisition. In this regard, the author espouses the instructional significance of WebQuests and web-based inquiry projects. Examples are provided of these and it is shown that the sourcing of information on the web for open-ended tasks can promote decision-making and problem-solving skills in students.

Chapter XXVII

Understanding Factors that Influence the Effectiveness of Learning Objects in Secondary School Classrooms..... 419
Robin Kay, University of Ontario Institute of Technology, Canada

The use of learning objects as a curricular resource in secondary schools has not been explored in sufficient depth in the K-12 setting – hence the purpose of this chapter. It looks at both students' and teachers' views of learning objects in a variety of subject domains. The results show that for learning objects to be able to engage students and teachers, they have to be well designed, user-friendly and interactive.

Chapter XXVIII

Tapping into Digital Literacy with Mobile Devices 436
Mark van't Hooft, Kent State University, USA

The prevalence of wireless mobile devices offers yet another avenue to foster digital literacy skills among the younger generation, especially since they are rather savvy with such gadgets. For these to impact on teaching and learning, the right context has to be weaved into the pedagogical framework. A few examples are given of the kind of educational activities that are suitable for use with these devices.

Chapter XXIX

Towards Safer Internet for Students with the Aid of a Hypermedia Filtering Tool..... 457
Fotis Lazarinis, University of Teesside, UK

With web-based learning becoming an important aspect of the education of students, the need to ensure that this impressionable group is not subjected to improper and wrong ideas in their surfing sojourns becomes important. In this chapter, the effectiveness of a filtering tool, developed using Java, is explored using the preferred websites of high school students in Greece. The results show that despite the security features of the computer laboratories, objectionable content that were still able to bypass them were blocked significantly by the filtering tool.

Chapter XXX
Wireless Technologies and Multimedia Literacies 471
Virginia E. Garland, The University of New Hampshire, USA

A survey of recent developments in wireless technologies and their role in shifting instructional practice from traditional literacies to multimedia literacies is explored in this chapter. With mobile devices such as smart phones and (ultralight) wireless notebooks offering easy connectivity to the Internet and access to interactive software, the scope for engaging learners with multimedia is greatly enhanced. It is shown that ample opportunities are available to foster inquiry, collaboration and project work among students when multimedia is used.

Volume II

Chapter XXXI
Good Old PowerPoint and its Unrevealed Potential 480
Pavel Samsonov, University of Louisiana at Lafayette, USA

The use of PowerPoint as an interactive tool for teaching is explored in this chapter, in contradistinction with its traditional role as a presentation tool. It seems that the full potential of PowerPoint is rarely or only minimally exploited in traditional teaching. The chapter provides practical tips on how simple computer skills can be used to create interactive and fun projects using PowerPoint, and argues for a case for its more effective use in classrooms.

Chapter XXXII
Children's Text Messaging and Traditional Literacy 492
Beverly Plester, Coventry University, UK
Clare Wood, Coventry University, UK
Samantha Bowyer, Coventry University, UK

The ubiquity of the mobile phone and the facility that it provides for texting presents opportunities to promote literacy among children. In this chapter, results of three investigations involving primary students' text messaging in English as well as indicators of their conventional literacy abilities are presented. It has been suggested that texting affords an avenue for children to articulate their thoughts in writing without the necessity to be bound by the rules of grammar and that the versions of words used in such communication suggest an ability to use sounds and words in a playful manner, the basic principles of which still hold in standard English.

Chapter XXXIII
Concept Mapping as a Mediator of Constructivist Learning 505
Gregory MacKinnon, Acadia University, Canada

This chapter focuses on the use of electronic concept mapping to organize ideas in a hierarchical manner. The software offer tremendous potentialities for creative configuring of concept maps and allows for their use in settings which promote collaboration, creativity and innovation among students. It has

been suggested that the range of applications for the use of electronic concept mapping in the K-12 classroom presents opportunities for the development of personal and social growth literacies when students negotiate meaning from ideas.

Chapter XXXIV
Electronic Performance Support System (EPSS) Tools to Enhance Success in School for Secondary Students with Special Needs 529
Katherine Mitchem, California University of Pennsylvania, USA
Gail Fitzgerald, University of Missouri, USA
Kevin Koury, California University of Pennsylvania, USA

There has been very little attempt in the literature to cater to the ICT needs of students with special needs. In this context, this chapter focuses on the use of electronic performance support systems to augment learning among secondary school students with mild disabilities. Several recommendations based on the findings of two funded projects are provided for effective implementation of such systems in the school setting.

Section III
Case Studies

Case studies are an important aspect of educational research. They are used especially in situations where it is necessary to obtain greater insights and perspectives from a particular research initiative or when it is necessary to focus on small samples as the target for the study. The chapters in this section explore issues such as technology grants to jump start literacy programs, transformations occurring in the ICT practices of model schools, university-high school collaborations involving students, metacognitve strategies of a group of students when they use the Internet to source for material for essay writing, and so on.

Chapter XXXV
A Case Study of Contrasting Approaches to Integrating Technology into the K-5 Classroom 551
Rebecca Brent, Education Designs, Inc., USA
Catherine E. Brawner, Research Triangle Educational Consultants, USA

This chapter reports on a study of how two schools which received grants to support technology integration into their curricula fared. Both followed the same integration model but adopted different implementation pathways. The different outcomes achieved in each school offer useful lessons – more importantly, there needs to be buying-in of the idea from teachers as well as the provision of ample support to infuse technology into the full range of their teaching subjects.

Chapter XXXVI
Using a Technology Grant to Make Real Changes 575
Lyn C. Howell, Milligan College, USA

In this chapter, the progress of a school which was a recipient of a technology grant to support ICT integration was traced over a few years. The results show that while the presence of a coach, training programs and incentives to use ICT tools in lessons helped teachers to warm towards these initiatives initially, there was significant waning of enthusiasm after the financing ended. Based on this experience, the author offers useful lessons for other schools and the pitfalls to avoid.

Chapter XXXVII

Emerging E-Pedagogy in Australian Primary Schools 588
Jennifer Way, University of Sydney, Australia

The chapter provides glimpses of the technology transformations in pedagogy that are occurring in some primary schools in Australia. A number of teachers in these schools have taken the lead in setting up learning environments that tap on the inclination of the younger generation to experiment with an array of digital technologies outside their school. This redefining of learning has positive implications in the way in which educational outcomes are assessed.

Chapter XXXVIII

Promoting New Media Literacy in a School District..... 607
Amy S. C. Leh, California State University, San Bernardino, USA
Lee Grafton, Palm Spring Unified School District, USA

How a technology grant afforded the implementation of initiatives that supported student learning in mathematics and faculty professional development via new media literacy skills is the subject of this chapter. The technologies used were effectively integrated into the instructional process, and this promoted enhanced learning outcomes among students. With respect to the continuing education of faculty, the key determinant of success is the evolution of a community of practice.

Chapter XXXIX

K-20 Technology Partnerships in a Rural Community 620
Linda R. Lisowski, Elizabeth City State University, USA
Claudia C. Twiford, Elizabeth City State University, USA
Joseph A. Lisowski, Elizabeth City State University, USA
Quintin Q. Davis, Christa McAuliffe Middle School, USA
Rebecca F. Kirtley, JC Sawyer Elementary School, USA

A collaborative effort between a university and a rural public school, which resulted in a grant to support instructional access to technology, is the focus of this chapter. The partnership exemplifies the kind of change that can be introduced in schools when university researchers take the lead in addressing equity issues in technology in the education setting through support from foundations. Several lessons based on the experience of embedding technology resources in the school are shared by the authors.

Chapter XL

Computer-Mediated Discussions within a Virtual Learning Community of High School and University Students 633
Tamara L. Jetton, Central Michigan University, USA

The chapter discusses on a collaboration between university and high school students that entailed the formation of a virtual community. Leveraging on computer-mediated discussions on the subject of literature, the project focused on developing skill sets in technology among students while augmenting their conventional literacies in reading and writing. The collaboration, communication and learning tasks promoted in this manner provided a platform for learning to be taken beyond the confines of traditional physical infrastructure and reiterate the utility of computer mediated discussion as a viable tool to enhance educational experiences.

Chapter XLI
Skillful Internet Reader is Metacognitively Competent 654
Carita Kiili, University of Jyväskylä, Finland
Leena Laurinen, University of Jyväskylä, Finland
Miika Marttunen, University of Jyväskylä, Finland

The chapter reports on a study where a group of upper secondary students were tasked to write a composition on a topic using materials sourced from the web. To gain insights into how the students approached their task, considerable emphasis was placed on not only how they searched, processed and evaluated the information but also on how their metacognitive strategies were interlaced within these processes. The results show that a student has to be metacognively competent in order to engage in constructively responsive reading.

Chapter XLII
Research Methodological Issues with Researching the Learner Voice..... 669
Gráinne Conole, The Open University, UK

This chapter emphasizes the importance of focusing on the student voice with appropriate methodologies in an attempt to better understand how they appropriate ICT tools in their learning. Drawing on a case study which explored students' use of technologies in four disciplines, the author suggests that students are now well entrenched in these learning environments and are able to use digital tools extensively to support their learning experience. These have implications on how courses are tailored and delivered to meet their learning needs.

Section IV
Assessment

With the proliferation of ICT practices in the educational space and their increasing integration into the curriculum, traditional rubrics of assessment are facing challenges to include online measures to some extent. In this section, issues related to assessment of new media literacy are explored by authors from the lens of their experience - for example, e-portfolios, interactive classroom communication systems, peer assessment using the Internet, automated essay scoring system, assessing course effectiveness in a learning community, and so on.

Chapter XLIII
What We Know About Assessing Online Learning in Secondary Schools 684
Art W. Bangert, Montana State University, USA
Kerry L. Rice, Boise State University, USA

The authors review the practice literature of assessing online courses in the high school setting. One of the drawbacks of such assessment protocols is that they are rather broad-based and not fine-tuned for application in specific delivery contexts, thus making it difficult to evaluate the courses despite the existence of general standards but bereft of rigorous rubrics for evaluation. To address this, the authors propose an evaluation framework that focuses on the theoretical underpinnings of three areas: instructional practices that are student-centered, learning communities that promote inquiry, and empirical results emanating from research on online courses.

Chapter XLIV
Usage of Electronic Portfolios for Assessment..... 702
Yasemin Gulbahar, Baskent University, Turkey

Assessing learning is often a complex task - more so in today's classroom where a diversity of delivery platforms, including ICT tools, pervade. The use of web-based electronic portfolios to assess students' learning in a holistic way is proposed in this chapter. Issues such as alignment with curriculum framework, assessment in relation to a set of rubrics and challenges in its implementation are discussed.

Chapter XLV
A Formative Analysis of Interactive Classroom Communication Systems Used in Secondary School Classrooms..... 720
Robin Kay, University of Ontario Institute of Technology, Canada

The use of an interactive classroom communication system that allows students to respond to multiple choice questions during a lecture is explored in this chapter. Results show that it can be a useful tool for formative assessment and that the use of this tool promotes increased learner engagement, motivation and participation. On the flip side, some students reported heightened stress levels and uncertainty of answers when the system is used in the formal test mode.

Chapter XLVI
Internet-Based Peer Assessment in High School Settings 743
Chin-Chung Tsai, National Taiwan University of Science and Technology, Taiwan

The Internet provides a valuable platform to promote peer assessment – with no face-to-face interaction and the cloak of anonymity, the scope for provisioning frank feedback and promoting interaction among students is enhanced. Using a high school setting, the chapter presents results to show that effective online peer assessment is contingent significantly on the students' metacognitive skills being brought to bear on the task in hand. Some practical tips for conducting online peer assessment are provided in light of these experiences.

Chapter XLVII
Course Assessment in a Teacher's Learning Community 755
Giorgos Hlapanis, University of the Aegean, Greece
Angélique Dimitracopoulou, University of the Aegean, Greece

This chapter describes an in-service course on the use of ICT in teaching, conducted via distance learning and implemented in the context of a learning community. Answers to questions such as what constitutes an effective course and what spawns the formation of a learning community are explored in order to derive measures of assessment. A key finding from this study is that the evolution of a learning community which is built on collegiality, commitment and trust is indispensable for the success of a course

Chapter XLVIII
Automated Essay Scoring Systems 777
Dougal Hutchison, National Foundation for Educational Research, UK

This chapter explores the computer marking of essays, a task which teachers generally find rather labor-intensive! A review of the literature in this area is provided, and this serves as a background to assess how effective the various commercial programs are in marking essays. Whether the automated essay scoring systems can be the final adjudicator of assigning grades for an essay is also considered.

Chapter XLIX
Metacognitive Feedback in Online Mathematical Discussion 794
Bracha Kramarski, Bar-Ilan University, Israel

The effectiveness of metacognitive support in an online inquiry discussion in mathematics is investigated in this chapter. It is shown that students who have been exposed to the 7-phase teaching steps corresponding to the IMPROVE strategy, which has metacognitive questioning as a key attribute, performed significantly better than those who have not been exposed to this strategy. The results of the study point to the utility of metacognitive feedback as a scaffolding tool to support inquiry learning in mathematics.

Section V
Professional Development

For ICT practices to be well linked with school practice, the continuing education of teachers is a must. It is only when they 'buy in' that the motivation to engage students with new media is given a fillip. In this context, the chapters in this section focus on the professional development of teachers with respect to new media literacy.

Chapter L
Moodling Professional Development Training that Worked 808
Leaunda S. Hemphill, Western Illinois University, USA
Donna S. McCaw, Western Illinois University, USA

The authors report on a teacher professional development program which involved the use of online teaching strategies and tools. Using an open-source course management system, the participants created their basic course shell and worked around this to develop courses to address the varied learning needs of their pupils. Improved learning gains were seen in the achievement tests of students in the different subjects.

Chapter LI

TPACK Development in a Teacher Education Program 823
Nancy Wentworth, Brigham Young University, USA
Charles R. Graham, Brigham Young University, USA
Eula Ewing Monroe, Brigham Young University, USA

For technology to be well integrated into the school curriculum, it is very important that the pre-service training of teachers prepares them adequately for this challenge. In this chapter, the authors describe the three levels of development in technological pedagogical content knowledge (TPACK) for the teacher education program at Brigham Young University. They advance the point of view that for a better connect between technology and instruction in schools, it is imperative that teacher educators also share in this vision at the pre-service stage.

Chapter LII

Self-Regulated Learning: Issues and Challenges for Initial Teacher Training 839
Manuela Delfino, Institute for Educational Technology - Italian National Research Council, Italy
Donatella Persico, Institute for Educational Technology - Italian National Research Council, Italy

With the pervasiveness of technology in the classroom and the need for students to take ownership of their own learning as well as be versed in collaborative skills, the inculcation of self regulated learning competencies among them becomes crucially imperative. The authors suggest that such competencies need to be developed among pre-service teachers so that they are well equipped to meet the learning needs of their charges when they are posted to schools. They draw on the experiences from a course in educational technology to further develop this thesis.

Preface

Information and communication technologies (ICT) are pervading society to an extent which many would not have even dreamt about as recently as a decade back. Practically, no aspect of societal endeavor has been left untouched by the relentless march of ICT. The ossified enclaves of many aspects of society have been rendered permeable by the osmotic gradients engendered by the forces of ICT!

One area that ICT is continuing to impact vigorously is education. The paradigms of traditional pedagogy are being reframed to the extent that purists set in the classical mould would not even have believed. These developments pose challenges for teachers and students. Policy makers and administrators will also have to increasingly grapple with the ICT dimensions of initiatives in the educational space.

The K-12 school setting has seen the influx of a diversity of ICT tools which aim to augment teaching and learning by capitalizing on the potentialities of ICT. For example, e-learning, multimedia, Web quests, electronic portfolios, automated scoring systems, video games, mobile devices, learning objects, 3-D virtual environments and Web 2.0 technologies are some of the ICT tools that have pervaded the educational scene. The K-12 setting has also been a laboratory for the trialing of new technologies for teaching and learning by educational researchers, and this has generated a wealth of findings.

The *Handbook of Research on New Media Literacy at the K-12 Level: Issues and Challenges* aims to explore the multi-faceted dimensions related to the use of ICT in teaching and learning in schools. By bringing together a wealth of educational studies on various aspects of ICT, we aim to address the need for practitioners to have a one-stop reference book for ideas on the latest thinking in the field.

A novel feature of the Handbook is that all contributions were commissioned from recently published, journal authors working in the field of ICT. This ensures the contemporary nature of the ideas explored in the chapters as well as helps to ensure a desired level of scholarship in the chapters. It was made clear to all contributors that their submissions must also pass the additional test of peer scrutiny. A Call for Chapters was thus not posted in the web, as is normally done for a project of this undertaking. Almost all chapters benefitted from the reviews by other contributors. A few chapters required a second round of revisions. Despite the 2-tier mechanism (commissioning contributions from published authors and peer review) to ensure a high quality of submissions, a handful of chapters had to be rejected – either because the referees' comments were not favorable or because the authors decided not to revise their chapters on the basis of the major revisions recommended by the referees.

In all, there are 52 chapters contributed by 91 authors from 51 institutions in 15 countries for this Handbook – a truly multinational effort! An international collaboration is indispensable when undertaking an ambitious project of this nature as well as for the strategic positioning of the Handbook as a definitive source of reference in the field of new media literacy.

For convenience, the 52 chapters have been broadly placed in one of five sections – Issues in new media literacy, ICT tools, Case studies, Assessment, and Professional development. This classification

allows interested readers to access materials in an area of interest. The classification is guided by our own reading of the chapters and it is possible that a chapter would also be suitable for placement in another section. There may be some duplication of content as judged from the titles of a few chapters – our stand is that different authors approach similar topics from the lens of their own experience and it is necessary to capture diverse perspectives as this can help to consolidate thinking in particular directions.

The target audiences for the Handbook include school teachers, educational administrators, policy makers, educational researchers, ICT specialists, and university academics – copies in public and university libraries would help to enhance the outreach effectiveness of the ideas in the Handbook. Rarely has an opportunity been provided to bring together a wealth of ideas in new media literacy from an array of experts under one platform.

A book of this magnitude will not have been possible without the support of many people. Our foremost gratitude goes to Dr Mehdi Khosrow-Pour, President of IGI Global, for his invitation for us to edit this Handbook. The staff at IGI Global have been a delight to work with. We appreciate the high level of professionalism and support displayed by their staff – grateful thanks to Kristin Roth, Rebecca Beistline, Julia Mosemann and Christine Bufton! We thank all authors for their chapters. A special 'thank you' also to most authors for acting as referees for the submissions of fellow authors! We thank the management of the National Institute of Education, Nanyang Technological University for their support and encouragement in the course of working on this project in the midst of our academic commitments.

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