## CONTENTS

### About the Instructors Manual  
1

### CHAPTER 1

**Chapter Objectives**  
2

**Key Questions**  
2

**Case Studies**  
2

- Dream a Better World: A Film Festival for Australian Primary Schools  
2

**Sample Student Response System Slides**  
2

**Review and Research Questions**  
3

- Review and research question 1.1  
3
- Review and research question 1.2  
4
- Review and research question 1.3  
5
- Review and research question 1.4  
5

**Self-Test Items**  
6

**Making IT Happen**  
7

**fYi Web Destinations for further research**  
8

**Special Additional Notes**  
9

### CHAPTER 2

**Chapter Objectives**  
3

**Key Questions**  
3

**Case Studies**  
3

- Teachers with Laptops in New Zealand: Impacts on Teachers and their Practice  
3
- Dance in Australia and New Zealand (DANZ)  
3
- Intel® Teach to the Future  
3

**Sample Student Response System Slides**  
3

**Review and Research Questions**  
4

- Review and research question 2.1  
4
- Review and research question 2.2  
5
- Review and research question 2.3  
5
- Review and research question 2.4  
5

**Self-Test Items**  
6

**Making IT Happen**  
7

**fYi Web Destinations for further research**  
8

**Special Additional Notes**  
9

### CHAPTER 3

**Chapter Objectives**  
5

**Key Questions**  
5

**Case Studies**  
5

- eLearning and developing an online learning solution  
5
- Designing a digital yearbook  
5
Using the ePALS program to develop enriching numeracy learning experiences with students in the early years

Sample Student Response System Slides

Review and Research Questions
  - Review and research question 3.1
  - Review and research question 3.2
  - Review and research question 3.3
  - Review and research question 3.4

Self-Test Items

Making IT Happen

fyi Web Destinations for further research

Special Additional Notes

CHAPTER 4

Chapter Objectives

Key Questions

Case Studies
  - Games: a gateway to developing a community of learners
  - Transforming learning with ICT

Sample Student Response System Slides

Review and Research Questions
  - Review and research question 4.1
  - Review and research question 4.2

Self-Test Items

Making IT Happen

fyi Web Destinations for further research

Special Additional Notes

CHAPTER 5

Chapter Objectives

Key Questions

Case Studies
  - Using KidiPads to enhance collaborative work with kindergarten children
  - Whole-school adoption of interactive whiteboards (IWBs)
  - Drugs.com: learning about drugs—a virtual reality

Sample Student Response System Slides

Review and Research Questions
  - Review and research question 5.1
  - Review and research question 5.2
  - Review and research question 5.3
  - Review and research question 5.4
  - Review and research question 5.5

Self-Test Items

Making IT Happen

fyi Web Destinations for further research

Special Additional Notes
CHAPTER 6
Chapter Objectives
Key Questions
Case Studies
- The GENESIS Project: generating eLearning systems in schools
- Evaluating ICT use in a Year 1 classroom
- From digital storytelling to ePortfolio development: mobile devices supporting learners
Sample Student Response System Slides
Review and Research Questions
- Review and research question 6.1
- Review and research question 6.2
- Review and research question 6.3
Self-Test Items
Making IT Happen
fyi Web Destinations
Special Additional Notes

CHAPTER 7
Chapter Objectives
Key Questions
Case Studies
- What’s your big idea for ICT?
- Learning with ICT: measuring ICT use in the curriculum
Sample Student Response System Slides
Review and Research Questions
- Review and research question 7.1
- Review and research question 7.2
- Review and research question 7.3
Self-Test Items
Making IT Happen
fyi Web Destinations for further research
Special Additional Notes

CHAPTER 8
Chapter Objectives
Key Questions
Case Studies
- Using games and simulation to teach artificial intelligence (AI)
- Connecting communities of learners and leaders with web-based technology called Centra
- Using the Learning Activity Management System (LAMS)
Sample Student Response System Slides
Review and Research Questions
- Review and research question 8.1
- Review and research question 8.2
Review and research question 8.3
Self-Test Items
Making IT Happen
fyi Web Destinations for further research
Special Additional Notes
About the Instructors Manual

This Instructors Manual is designed to be used in conjunction with the book – *Transforming Learning with ICT: Making IT Happen*.

In addition, this manual complements the web supplementary material available to assist instructors who adopt the book.

Incorporated in the design of that book is the presentation of features within each Chapter. Those features encourage engagement by the reader through prompting reflections and responses. This manual provides sample responses to the following sections:
- Case Studies
- Review and research questions
- Make IT Happen

The sample responses must be viewed within the important understanding that many responses require reflections and responses which link with the reader’s organisational setting, thoughts, perceptions, and ideas in relation to transforming learning with ICT.

The web supplementary material provides instructors with
- Powerpoint Presentations for each Chapter
- Sample clicker content for inclusion where a student response system might be available
- Self-test Items
- fyi Websites for further research

We trust that you find this manual assists you in the design and implementation of learning environments which explores the challenge of transforming learning with ICT and that you can make IT happen.

Glenn Finger, Glenn Russell, Romina Jamieson-Proctor, Neil Russell
CHAPTER 1

Chapter Objectives
By the end of this chapter, you should be able to:

• identify key questions and key themes related to ICT in education

• formulate personally meaningful definitions for the terms ‘information and communication technologies’ and ‘technology’

• analyse policies, statements, media releases and claims for ICT use in education using theoretical frameworks

• appreciate the potential that ICT has to transform learning and teaching

• assess the extent to which those transformational implications are evident in the learning and teaching contexts which you are familiar with

Key Questions
The key questions raised in this chapter are:

• What is ICT?

• Why use ICT in learning and teaching?

• How might ICT be used in learning and teaching?

Case Studies

Dream a Better World: A Film Festival for Australian Primary Schools

1. What are aspects of transformational uses of ICT in this case study?
   Sample Response - As host for the Film Festival, the Coomera State School students are involved in authentic, real world tasks to organise and conduct the festival. Students are involved in design challenges and ‘work technologically’ in investigating, ideating, producing and evaluating elements required to effectively conduct the festival. For example, they are involved in designing the tickets, designing the program, designing ways to document their dreams of a better world, including interviews of sporting, business, political and film industry celebrities as well as staff and students.

2. Why do you believe that “Dream a Better World” can be justified educationally?
   Sample Response - As ICT resources in the form of digital video cameras and editing software have become more affordable for schools, this festival attempts to:
   • engage students in the production process which explores beneficial use of these technologies by students;
   • provide opportunities for students in Australia to express their thoughts, feelings and ideas about the world they live in using multimedia; and
   • encourage active participation by children as socially, culturally and environmentally aware citizens.

Sample Student Response System Slides

Ice breaker - The correct answers appear in bold
What do you think ICT refers to?
A. I can teach
B. Integrating computers into teaching
C. Investigating computers and technology
D. Information and communication technologies

Understanding check - The correct answers appear in bold
The terms ICT and Technology are often used interchangeably. Which of the following best describes ICT?
A. computer and computer-related devices  
B. new and emerging technology devices used for information purposes  
C. new and emerging technology devices used for communication purposes  
D. all of the above

In the stages of teacher development conceptualised by Trinidad, Newhouse & Clarkson, which stages are proposed by them as being located beyond the critical use border?  
A. Integration and Transformation  
B. Inaction and Investigation  
C. Investigation and Application  
D. Inaction and Application

Which of the following is a theoretical reason argued by Jonassen for using ICT as Mindtools?  
A. They can function as intellectual partners  
B. They can engage students in meaningful learning  
C. They can be used as constructivist knowledge construction tools  
D. all of the above

Tracking progress - Individual responses will be obtained here
How do you feel about using computers?  
A. extremely confident  
B. very confident  
C. reasonably confident  
D. not confident  
E. terrified

Is there a computer available for you to use at home?  
A. yes  
B. no

Do you have access to the Internet in your home?  
A. yes  
B. No

Attitude check - Individual responses will be obtained here
Which of the following most accurately describes your attitude to using ICT?  
A. I am excited about the transformational potential of ICT for teaching and learning  
B. I am most interested in using ICT to get my work done as quickly as possible  
C. I will learn about ICT because I have to  
D. I avoid using ICT

Review and Research Questions

Review and research question 1.1
Clarifying your thoughts about the use of terms
How would you describe the differences between the terms ‘technology’ and ‘information and communication technologies’ (ICT)? What are some other terms which people use to refer to ICT?

Record your thoughts:

Sample Response - The term ICT is often used to refer to computer-based and computer-related devices, but is broadened in this book to include the development of a range of other devices that can be used for information and communication purposes. This more comprehensive definition of ICT allows for new and emerging ICT devices and applications such as, but not limited to, the Internet, mobile phones, digital cameras, plasma screens, digital video recorders, learning objects, personal digital assistants (PDAs).
pocket PCs, podcasts, interactive whiteboards, wireless technologies and networking, virtual reality, voice over Internet protocol (voIP) and wearable systems. Other terms used to refer to ICT include educational computing, educational technology, computer technology, technology, technology tools, learning technology, and information technology.

• What do you believe have been the most significant technological developments?

Sample Response - While opinions might differ, arguably the most significant technological developments can be related to progress in communication through the advance of media related to writing, printing, audio-visual information and the method and speed of exchanging such information.

• What do you believe have been the most significant ICT developments?

Sample Response - The most significant ICT developments can be related to advances in computing technology, such as the use of the Internet in the context of information access and exchange and worldwide communication.

• Why do you believe that ICT should be given prominence in the design of learning and teaching environments in the 21st century?

Sample Response - ICT reflect rapid, dynamic development and the proportion of the population accessing these technologies is also rapidly increasing. Consequently advanced skills and knowledge relating to ICT, such as computers, phones and audiovisual equipment appear to be necessary for an informed member of the 21st century society. There are pedagogical, sociological and economical factors that determine the utilisation of ICT in diverse educational settings and across the curriculum.

Review and research question 1.2

Stages of ICT implementation and the dimensions of ICT use

• Describe the stages of ICT implementation and the dimensions of ICT use theorised in the preceding section.

Sample Response - Dwyer, Ringstaff & Sandholtz (1991)
Entry, adoption, adaptation, appropriation, invention

Kraver (1997)
Wave 1: Early adoption—‘End of the beginning’
Wave 2: ICT integrated curriculum—‘Buildup’
Wave 3: Research-based learning technologies are released and transform education—‘Final push’

Jonassen (2000)
Learning about computers, Learning from computers, Learning with computers

Stage 1: Acquiring skills
Stage 2: Enhancing learning and teaching
Stage 3: Transforming

• Explain your thoughts about the conceptualisation of transforming learning with ICT.

Sample Response - ICT can be conceptualised to transform learning in ways which go beyond assessing and enforcing traditional knowledge areas to creating and constructing new knowledge and ways of learning about them. The two ‘transformative’ dimensions of ICT use in which ICT are integral components of broader curricular reforms, changing not only how students learn but what they learn and altering the organisation and structure of schooling itself, flag an emerging trend which transcends earlier conceptualisations of ICT integration. This trend ICT use as part of a broader movement towards curriculum and school reform (Fluck, 2003; Fullan, 1993; Nichol & Watson, 2003).

• What does transformational use of ICT mean to you? Discuss in terms of ICT as productivity tools and as Mindtools.

Sample Response - The transformational aspects of ICT can be related to their use as a Mindtool. The contribution Jonassen makes is proposing the use of ICT as cognitive tools, which he refers to as Mindtools for engaging and enhancing multiple forms of thinking in learners. ‘Mindtools’, therefore, are computer-based applications that require students to think in meaningful ways in order to use the application to
represent what they know: ‘Mindtools assess the effects of learning with computer technologies when learners enter into an intellectual partnership with the computer’ (Jonassen, 2000, p. 4). This approach contrasts with Jonassen’s reference to the use of ICT as productivity tools, for example, word processing which allows us to become efficient, effective and productive writers through ‘the ease of editing’ (p. 16). However, Jonassen is not convinced that ICT necessarily make us more creative writers. Thus, he advocates going beyond the use of ICT as productivity tools and instead using ICT as Mindtools or intellectual partners that enhance the learner’s ability to think.

**Review and research question 1.3**

**The key ICT themes**

While there are assumptions that ICT are important for learning and teaching, there are major issues and implications related to learning with ICT.

Record your thoughts:

- What are the practical implications of learning with ICT that you, as a teacher, should consider?

**Sample Response** - The ICT key themes are interrelated and activities need to address all themes (i.e. educational, societal/cultural, and technical issues) to ensure the efficient use of ICT. Practical implications include standards for teachers, pedagogical issues, assessment and reporting, measuring ICT integration, barriers to ICT integration such as lack of teacher training and development, lack of curriculum, technical and administration support, limited time for teacher planning, difficulty of computer access, budget constraints, and resistance to change by many educators.

**Review and research question 1.4**

In terms of the MCEETYA research strategy for ICT, what do you believe are the most relevant questions for informing your practice?

Record your thoughts:

**Sample Response** - While different people will have different questions relevant to their context, specifically, the research strategy (MCEETYA, 003, p. 5) states that research related to ICT use and impact in each of these areas should consider the following overlapping dimensions:

- **conditions for learning**—providing the conditions necessary for effective student, staff and community engagement
- **learning possibilities**—exploring how to transform, enrich and extend learning
- **educational effectiveness**—ensuring effective curriculum, pedagogy, student learning, assessment and school transformation
- **equity**—providing appropriate student, staff and community access, participation and satisfaction, as well as improving achievement.

- How accessible is ICT research for teachers?

**Sample Response** - ICT research is readily accessible for teachers through online resources and printed media. However, a priority identified has been to increase access further by using ICT to make all school-related educational research accessible to teachers, students, parents, educational leaders, politicians and the community (MCEETYA, 2003, p. 3).

- Reflect upon the claims for transforming learning with ICT, and summarise your thoughts about making the transformation happen. Consider the role which research might play in exploring the key themes and issues which you believe are challenges in your context from those identified in Table 1.5.

**Sample Response** - The transformation of learning through ICT is dependent on various factors and though it might be conceptualised as a strategic implementation process the reality of such implementation potentially encounters unforeseen barriers. As research suggests the transformation in educational settings is progressing slower than expected and various reasons for this have been identified. The discrepancies between theory and practice provide possible explanations as do the potential barriers to each of the key ICT themes. Research and investigation of issues related to the successful implementation
of ICT in the context of transforming teaching and learning can play an important role to overcome identified barriers and support progress.

Self-Test Items
The correct answers appear in **bold**.

1. The terms ICT and Technology are often used interchangeably. Which of the following best describes ICT?
   - a. computer and computer-related devices
   - b. new and emerging technology devices used for information purposes
   - c. new and emerging technology devices used for communication purposes
   - d. **all of the above**

2. According to Cerych (1985), which three factors have been identified as key agencies in the ICT and education interface?
   - a. Learning technology, educational technology, and educational computing
   - b. Hardware, software and the Internet
   - c. **Sociological pressure, economic pressure, and pedagogical justification**
   - d. First wave, second wave, and third wave

3. In the stages of teacher development conceptualised by Trinidad, Newhouse & Clarkson, which stages are proposed by them as being located beyond the critical use border?
   - a. **Integration and Transformation**
   - b. Inaction and Investigation
   - c. Investigation and Application
   - d. Inaction and Application

4. Type II educational applications, proposed by Maddux, LaMont Johnson & Willis, refers to the use of ICT to
   - a. Assist learners to acquire facts by rote memory
   - b. **Make available new and better ways of teaching**
   - c. Enable generally passive involvement by the user
   - d. Have the software developer predetermine everything that happens on the screen

5. Which of the following is a theoretical reason argued by Jonassen for using ICT as Mindtools?
   - a. They can function as intellectual partners
   - b. They can engage students in meaningful learning
   - c. They can be used as constructivist knowledge construction tools
   - d. **all of the above**

6. Tomei refers to the failure to understand that the technology itself is not the goal is part of
   - a. Knowledge representation tools
   - b. **The technology facade**
   - c. Organisational culture of schools
   - d. **all of the above**
7. Which of the following have been identified by Shelley, Cashman, Gunter & Gunter, as barriers to ICT Integration include
   a. Lack of teacher training and professional development
   b. Lack of curriculum, technical and administration support
   c. Resistance to change by many educators
   d. all of the above

8. Equity issues related to access to ICT and participation levels in ICT use is referred to as
   a. Productivity tools
   b. Political trends
   c. The digital divide
   d. Economic trends

9. Which of the following is not one of the overlapping ICT research dimensions encouraged in the MCEETYA (2003) Research Strategy?
   a. Conditions for learning
   b. Educational effectiveness
   c. Learning possibilities
   d. Theoretical and practical dichotomy

10. Underlying the research priorities of the MCEETYA (2003) Research Strategy is the notion of
    a. The transformational potential of ICT
    b. ICT skills and knowledge
    c. Learning about ICT
    d. Using ICT to do tasks more efficiently

**Making IT Happen**

Simply having access to ICT and the appropriate ICT infrastructure to design learning and teaching situations is insufficient to ensure that meaningful use of ICT occurs.

Consider how you currently use ICT, or might use ICT with students.

In terms of the classifications of Type I and Type II applications, and ICT as productivity tools and Mindtools, identify how these would impact upon your use of ICT for your learning and teaching.

Formulate your response.

*Sample Response* - Though there is a definite role for ICT in teaching and learning to support traditional learning, ICT provide the potential to transform learning and teaching. The conceptualisation of Type I and Type II applications, and ICT as productivity and Mindtools can assist in identifying innovative ways to change what, how and where students learn. For example, as well as using software to support basic learning of curriculum content (Type I applications), knowledge and skills acquired can be used in complex ICT tasks, such as that of creating a film in a teamwork situation (Type II application). Similarly, many teachers seem to be engaging their students in using ICT as productivity tools, for example, to word process and publish assignments. Used as Mindtools, ICT can become intellectual partners used as constructivist knowledge construction tools, engage learners in forms of reflective thinking, and can scaffold new forms of thinking and reasoning. That is, an implication is that learners become critical thinkers as they use ICT as Mindtools.
**f.y.i. Web Destinations for further research**

**General Issues**

**International Society for Information Technology in Education (ISTE) [http://www.iste.org]**

Provides information, research and reports about ICT.


**Milken Family Foundation [http://www.mff.org/edtech]**

Provides research reports about ICT in education.


**21st Century Workplace Skills [http://www.21stcenturyskills.org]**

Outlines six key elements of 21st century learning.


Provides access to the latest information on education, science and training.


**EdNA Online Education Network Australia [http://www.edna.edu.au]**

Managed by education.au limited, EdNA Online supports and promotes the benefits of the internet for learning, education and training in Australia. It is organised around Australian curricula, its tools are free to Australian educators, and it is funded by the bodies responsible for education provision in Australia—that is, all Australian governments.

**MCEETYA ICT in Schools Taskforce [http://icttaskforce.edna.edu.au]**

Here you can view the various strategic reports, and documents such as *Research strategy: Learning in an online world*, accessible from [http://icttaskforce.edna.edu.au/icttaskforce/Jahia/home/pid/23].

**Australian Information and Communication Technology Committee (AICTEC) [http://www.aictec.edu.au]**

AICTEC encourages the advancement of learning and teaching in Australia through the effective and efficient use of information and communication technologies (ICT) and online services to enable all sectors of education and training to contribute to the growth and vitality of Australia’s society and economy.

**The Learning Federation (TLF) [http://www.thelearningfederation.edu.au/tlf2]**

TLF, an initiative of the state, territory and federal governments of Australia and New Zealand, employs emerging technologies to produce world-class online curriculum content to encourage student learning and support teachers in Australian and New Zealand schools.

**Wikipedia, the Free Encyclopaedia [http://en.wikipedia.org]**

Wikipedia’s goal is to create a free, reliable encyclopaedia—indeed, the largest encyclopaedia in history, in terms of both breadth and depth. Investigate definitions and discussion about social determinism [http://en.wikipedia.org/wiki/Social_determinism] or technological determinism [http://en.wikipedia.org/wiki/Technological_determinism].

**Australian Research Council (ARC) [http://www.arc.gov.au]**
The mission of the Australian Research Council is to advance Australia’s research excellence to be globally competitive and deliver benefits to the community. The website provides access to publications, research grant applications and information.

**Legal and Ethical Issues**

**Copyright Aware <http://www.copyrightaware.gov.au>**

Provides copyright information for principals, teachers, librarians, technicians, support staff and students. This is a joint initiative of the Department of Education, Science and Training (DEST) and MCEETYA.

**Turnitin.com <http://turnitin.com>, Plagiarism.org <http://plagiarism.org>**

Provide information about the legal ramifications of ‘cybercheating’ and plagiarism.

**Copyright Information sheets <http://www.copyright.org.au/publications infosheets.htm>**

Provides a list of information sheets that can be downloaded. Relevant sheets would be G056 ‘Internet: copying and downloading’ and G032 ‘Videos and films: screening in class’.

**Digital Disconnect: The widening gap between Internet-savvy students and their schools <http://www.pewinternet.org/pdfs/PIP_Schools_Internet_Report.pdf>**

An interesting report based on American schools.

**Digital Divide <http://www.digitaldivide.org>**

This site, cosponsored by the Harvard Center for International Development and the Massachusetts Institute of Technology, focuses on issues related to the digital divide.

**Gender equity <http://www.aauw.org>**

This site is coordinated by the American Association of University Women.

**Special Additional Notes**
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