## Contents

1 Introduction to Emerging Technologies for the Classroom: A Learning Sciences Perspective ........................................................... 1
Chrystalla Mouza and Nancy C. Lavigne

Part I Technologies that Support Learning to Understand and Create

2 Curricular Activity Systems Supporting the Use of Dynamic Representations to Foster Students’ Deep Understanding of Mathematics .................................................... 15
Phil Vahey, Jennifer Knudsen, Kenneth Rafanan, and Teresa Lara-Meloy

3 Dynabooks: Supporting Teachers to Engage All Learners in Key Literacies ............................................................... 31
Jeremy Roschelle, Susan Courey, Charles Patton, and Elizabeth Murray

4 Teaching Engineering Design with Digital Fabrication: Imagining, Creating, and Refining Ideas .............................................. 47
Jennifer L. Chiu, Glen Bull, Robert Q. Berry III, and William R. Kjellstrom

5 Professional Development Programs for Teaching with Visualizations .................................................................................. 63
Libby Gerard, Ou Lydia Liu, Stephanie Corliss, Keisha Varma, Michele Spitulnik, and Marcia C. Linn
Part II Technologies that Support Learning by Collaboration

6 Networked Technologies for Fostering Novel Forms of Student Interaction in High School Mathematics Classrooms ................................................................. 81
   Tobin White

7 Supporting Collaborative Knowledge Construction with Web 2.0 Technologies ................................................................................. 93
   James D. Slotta and Hedieh Najafi

8 Networked Technologies to Foster Students’ Collaboration and Reflection ................................................................. 113
   Eleni A. Kyza

9 Like, Comment, Share: Collaboration and Civic Engagement Within Social Network Sites ......................................................... 127
   Christine Greenhow and Jiahang Li

Part III Technologies that Support Anytime, Anyplace Learning

10 The Role of One-to-One Computing in the Education of at-Risk High-School Students ............................................................. 145
    Chrystalla Mouza and Albert Cavalier

11 Virtual Middle School Courses to Support Anytime, Anyplace Learning ................................................................................. 161
    Cathy Cavanaugh and Feng Liu

12 The Potential of Mobile Technologies to Connect Teaching and Learning Inside and Outside of the Classroom .......... 175
    Mark van’t Hooft

13 Mobile Media Learning: Ubiquitous Computing Environments for the Mobile Generation ......................................................... 187
    Kurt D. Squire

Part IV Technologies that Support Learning by Gaming

14 Design Principles for Creating Educational Virtual Worlds .......... 205
    Brian C. Nelson, Diane Jass Ketelhut, Younsu Kim, Cecile Foshee, and Kent Slack

15 Narrative-Centered Learning Environments: A Story-Centric Approach to Educational Games ............................................... 223
    James C. Lester, Jonathan P. Rowe, and Bradford W. Mott
Contents

16 Creative Play in Virtual Worlds: Avatar Designs, Language Play, and Cheats ................................................................. 239
Deborah A. Fields and Yasmin B. Kafai

17 Imagining, Creating, Playing, Sharing, Reflecting: How Online Community Supports Young People as Designers of Interactive Media ................................................................. 253
Karen Brennan and Mitchel Resnick

18 Epilogue: Designing and Integrating Emerging Technologies for Learning, Collaboration, Reflection, and Creativity .............. 269
Nancy C. Lavigne and Chrystalla Mouza

About the Authors ........................................................................................................................................ 289

Index .......................................................................................................................................................... 301