# USING TECHNOLOGY TO ENHANCE SPECIAL EDUCATION

# ADVANCES IN SPECIAL EDUCATION

Series Editors: Festus E. Obiakor and Jeffrey P. Bakken

#### Previous Volumes:

- Volume 27: Special Education International Perspectives: Biopsychosocial, Cultural and Disability Aspects, Edited by Anthony F. Rotatori, Jeffrey P. Bakken, Sandra Burkhardt, Festus E. Obiakor, and Umesh Sharma
- Volume 28: Special Education International Perspectives: Practices Across the Globe, Edited by Anthony F. Rotatori, Jeffrey P. Bakken, Sandra Burkhardt, Festus E. Obiakor, and Umesh Sharma
- Volume 29: The Broad Autism Phenotype, Edited by Julie A. Deisinger and Anthony F. Rotatori
- Volume 30a: Interdisciplinary Connections to Special Education: Important Aspects to Consider, Edited by Jeffrey P. Bakken and Festus E. Obiakor
- Volume 30b: Interdisciplinary Connections to Special Education: Key Related Professionals Involved, Edited by Festus E. Obiakor and Jeffrey P. Bakken
- Volume 31: General and Special Education in an Age of Change: Impact on Students With Disabilities, Edited by Jeffrey P. Bakken and Festus E. Obiakor
- Volume 32: General and Special Education in an Age of Change: Roles of Professionals Involved, Edited by Jeffrey P. Bakken and Festus E. Obiakor
- Volume 33: Viewpoints on Interventions for Learners With Disabilities, Edited by Festus E. Obiakor and Jeffrey P. Bakken
- Volume 34: Special Education for Young Learners With Disabilities, Edited by Jeffrey P. Bakken and Festus E. Obiakor
- Volume 35: Special Education Transition Services for Students With Disabilities, Edited by Jeffrey P. Bakken and Festus E. Obiakor
- Volume 36: Traditional and Innovative Assessment Techniques for Students With Disabilities, Edited by Festus E. Obiakor and Jeffrey P. Bakken

# USING TECHNOLOGY TO ENHANCE SPECIAL EDUCATION

#### **EDITED BY**

## JEFFREY P. BAKKEN

Bradley University, USA

And

## FESTUS E. OBIAKOR

Sunny Educational Consulting, USA



United Kingdom – North America – Japan India – Malaysia – China Emerald Publishing Limited Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2023

Editorial matter and selection © 2023 Jeffrey P. Bakken and Festus E. Obiakor. Individual chapters © 2023 The Authors.

Published under exclusive licence by Emerald Publishing Limited.

#### Reprints and permissions service

Contact: permissions@emeraldinsight.com

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

#### **British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

ISBN: 978-1-80262-652-0 (Print) ISBN: 978-1-80262-651-3 (Online) ISBN: 978-1-80262-653-7 (Epub)

ISSN: 0270-4013 (Series)



ISOQAR certified Management System, awarded to Emerald for adherence to Environmental standard ISO 14001:2004.

Certificate Number 1985 ISO 14001



# **CONTENTS**

About the Editors	vii
About the Contributors	ix
Preface	xv
Using Technology to Enhance Special Education: An Introduction Erik A. Dalmasso, Jeffrey P. Bakken, T. Scott Estes and Quentin M. Wherfel	1
Using Technology to Enhance Learning for Students With Learning Disabilities Alicia Schmeisser and Carrie Anna Courtad	15
Research on Using Technology for Students With Emotional and/ or Behavioral Disorders: Cruel Optimism or Meaningful Progress? Frederick J. Brigham, Christopher Claude, John William McKenna and Larissa Lemp	29
Using Technology to Enhance Learning for Students With Intellectual Disabilities  Emily C. Bouck, Holly Long and Larissa Jakubow	51
Using Technology to Enhance Learning for Students Who Are Deaf/Hard of Hearing  Angi Martin and Julie Cox	71
Using Technology to Enhance Learning for Students With Visual Impairments Stacy M. Kelly	87

vi CONTENTS

Using Technology to Enhance Learning for Students With Autism Spectrum Disorders Shannon Stuart and Kris Van Handel	105
Using Technology to Enhance Learning for Students With Extensive Support Needs Robert C. Pennington, Monique Pinczynski and Kathryn Davis	125
Using Technology to Enhance Learning for Students with Traumatic Brain Injuries  Quentin M. Wherfel and Jeffrey P. Bakken	143
Using Digital Comic Creation to Improve Adolescents' Written Narratives  Ginger G. Collins and Stephanie F. Reid	159
Technology as a Bridge to Co-create Inclusive and Equitable Learning Environments for Students with Intersectional Identities Cristina Santamaría Graff, Jeremy F. Price and M. Nickie Coomer	181
Using Technology to Enhance Learning for Students from Culturally and Linguistically Diverse Backgrounds Lenwood Gibson, Festus E. Obiakor and Sunday O. Obi	199
Using Technology to Enhance Learning for Students with Physical Disabilities and Other Health Impairments  Eugene Asola, Matthew Grant and Samuel R. Hodge	215
Using Technology to Enhance Learning in Special Education: Moving Forward Sunday O. Obi, Festus E. Obiakor, Lenwood Gibson, Kristen E. Obiakor and Nkechi Amadife	233
Index	247

# **ABOUT THE EDITORS**

**Jeffrey P. Bakken** is a Professor of Special Education at Bradley University. He has a bachelor's degree in Elementary Education from the University of Wisconsin-LaCrosse and graduate degrees in the area education-learning disabilities from Purdue University. Dr Bakken has received the College of Education and the University Research Initiative Award, the College of Education Outstanding College Researcher Award, the College of Education Outstanding College Teacher Award, and the Outstanding University Teacher Award from Illinois State University. His specific areas of interest include learning disabilities, emotional and behavioral disorders, reading comprehension, response to intervention, collaboration, transition, teacher effectiveness, assessment, learning strategies, assistive technology, smart classrooms, and smart universities. He has published over 200 works that include books, chapters, journal articles, proceedings at international conferences, audio tapes, encyclopedia articles, newsletter articles, book reviews, a monograph, a manual, and one publisher website. He has also made over 260 presentations at international/national and regional/state conferences. Lastly, he has authored or coauthored numerous grants totaling over \$1,000,000.00.

Festus E. Obiakor, PhD, is the Chief Executive Manager at Sunny Educational Consulting, Shorewood, Wisconsin. He earned his Master's degree in Special Education (Educational Diagnostician) at Texas Christian University, Master's degree in Psychology (Instructional Psychology) at New Mexico State University, and PhD degree in Special Education (and minor in Educational Administration and Leadership) at New Mexico State University. He has taught at Rust College, The University of Tennessee-Chattanooga, Henderson State University, Emporia State University, the University of Wisconsin-Milwaukee, The City College of New York, and Valdosta State University. He served as Department Chair/Head at both The City College of New York and Valdosta State University, respectively. A teacher, scholar, leader, and consultant, he has served as Distinguished Visiting Professor at various universities. He is the author of more than 200 publications, including books, chapters, articles, and commentaries; and he has presented 250 papers at national and international conferences. He serves on the editorial boards of reputable nationally and internationally refereed journals, including Multicultural Learning and Teaching (MLT) in which he serves as Founding/Executive Editor. Dr Obiakor is a leader involved in many landmark scholarly works in the fields of general and special education, with particular focus on African American and other culturally and linguistically diverse (CLD) learners, and he continues to prescribe multidimensional methods of assessment,

teaching, and intervention for these individuals. Based on this premise, Dr Obiakor created the Comprehensive Support Model (CSM), an intervention model that values the collaborative, consultative, and cooperative energies of students, families, teachers/service providers, communities, and government agencies.

# ABOUT THE CONTRIBUTORS

**Nkechi Amadife**, PhD, is a Professor and the Head of Public Services and Coordinator of Library Instruction at Kentucky State University in the University library. Dr Amadife earned her PhD in Educational Policy Studies with specialty in Higher Education from the University of Kentucky. Additionally, Nkechi has over 20 years of experience of classroom and administrative experience working with diverse students and faculty. She has taught Liberal Arts – Integrative Studies, an interdisciplinary course. Her specific areas of interest include information literacy, biculturalism, and inclusion.

**Eugene F. Asola**, PhD, is a Professor and Associate Department Head for Teacher Education at College of Education and Human Services, Valdosta State University and a *Fellow* in the Carnegie African Diaspora Program. Asola's area of research includes health and wellness, physical education and special education teaching, supervision and policy. He is a Managing Editor for the *Multicultural Learning and Teaching* journal, and a reviewer for the National Association for Kinesiology in Higher Education Journal. He is also a site visitor for Georgia Professional Standards Commission (Ga-PSC) and the Council for the Accreditation of Educator Preparation (CAEP).

**Emily C. Bouck** is a Professor and Director of the Special Education Program at Michigan State University. Her research focuses primarily on mathematical interventions for students with disabilities – with particular attention to students with intellectual and developmental disabilities – and students at-risk, with heavy emphasis on technology-based mathematics interventions.

Frederick J. Brigham, PhD, is a Professor of Special Education at George Mason University. He served as the President of the CEC Division for Research and Editor of Behavioral Disorders. He received his PhD from Purdue University. Before doctoral work, he was a Special Education Teacher of students with E/BD at the secondary levels and a sixth-grade teacher in Ohio. He also served as a special education consultant in Iowa and as Director of Special Education in North Dakota. Before joining George Mason University, he served on the faculties of Valparaiso University, Bowling Green State University, and the University of Virginia.

**Christopher Claude**, MEd, is a former Special Education Teacher and doctoral student at George Mason University. He was awarded a grant from OSEP to study policy solutions to the special education teacher shortage and to improve the educational outcomes for all students with disabilities.

Ginger G. Collins is an Associate Professor in the School of Speech, Language, Hearing, and Occupational Sciences at the University of Montana. She directs the Motivational Adolescent Research in Vocabulary and Expressive Literacy (MARVEL) Lab, and her research interests include language-literacy interventions, preventative measures for at-risk youth, and interprofessional education.

M. Nickie Coomer is an Assistant Professor of Education at Colorado College. Prior to pursuing her doctorate, she taught special education for 10 years, working specifically with students labeled as having emotional disturbances. Approaching her research with the questions she held as an educator, Nickie's current inquiry focuses on cultural cognitive schemas around race and emotional and behavioral disorders that teachers, parents, and students develop, share, and even dispute. By studying the cultural processes of special education through Critical Disability Studies theories, Nickie hopes to add to the legacy of critical special education research.

Carrie Anna Courtad is a Full Professor in the Department of Special Education at Illinois State University. Her areas of interests are literacy, special education technology, special education policy, and teacher preparation. She received her PhD from Michigan State University where she was a Special Education Technology Scholar.

Julie Cox, PhD, CCC-SLP, is an Assistant Professor and Graduate Coordinator in the Department of Speech Pathology and Audiology at Western Illinois University. Dr Cox teaches a variety of courses and conducts pedagogical research. She holds the Certificate of Clinical Competence from ASHA and the Illinois professional license.

Erik Dalmasso, PhD, serves as the Program Director and Assistant Professor for the Higher Education Administration and Leadership EdD program at Bradley University. Dr Dalmasso teaches and designs coursework focused within the higher education and leadership curriculum, including Community College Leadership, the Contemporary Learner, Ethics and Political Foundations, and Data Analysis and Reporting. He is an outspoken advocate for rural student populations and their matriculation to a postsecondary learning environment. His research interests also include community college education, adult learning, social capital, and postsecondary barriers.

**Kathryn Davis** is a doctoral student at the University of North Carolina at Charlotte (UNCC) and is advised by Dr Fred Spooner. Kathryn received her undergraduate and master's degrees from Florida State University (FSU). During her time at FSU, she completed her Registered Behavioral Technical (RBT) certification and assisted Dr Jenny Root on research projects focusing on Modified Schema Based Instruction (MSBI). After graduation Kathryn was employed as a self-contained high school teacher certified in adapted curriculum before continuing her educational pursuits at UNCC.

**T. Scott Estes**, EdD, serves as an Assistant Professor and EdD Program Director of PreK-12 Education Administration and Leadership at Bradley University. Prior to 29 years of experience in public education as a teacher, principal, and district office administrator, Dr Estes received his BS at Bradley University, his MS in Education at Illinois State University, his EdS at Eastern Illinois University, and his doctorate at Aurora University. Dr Estes' interests are focused on instructional practice, professional development, and student efficacy. He is, most importantly, a husband and father of four.

Lenwood Gibson, Jr. is an Associate Professor and Program Coordinator at Queens College. Dr Gibson's instructional responsibilities include courses in Applied Behavior Analysis and special education research designs. His current research focus includes: (1) the effective use of computer-assisted instruction as a supplemental tool for students at-risk for academic failure, particularly in urban schools; (2) improving academic achievement for Black, Indigenous, and Student of Color (BISOC); (3) closing the research to practice gap between effective, research-based strategies and the degree to which special education teachers use them with their daily instruction.

Cristina Santamaría Graff is an Associate Professor of Special Education, Urban Teacher Education and is serving as Interim Assistant Dean of Student Support and Diversity at the Indiana University School of Education-Indianapolis at IUPUI. She is a co-PI of the Digital Education Hub where she provides sustainable and rigorous support for K-12 students through resources codeveloped with community stakeholders, families, and educators. She has expertise in bilingual, multicultural special education, and her scholarship focuses on ways community-engaged partnerships with families of children with disabilities can transform inequitable practices impacting youth with intersectional identities of difference.

Matthew Grant is an Associate Professor of Teacher Education in the Dewar College of Education and Human Services at Valdosta State University, teaches within the undergraduate and graduate health and physical education programs. He continues to research within sport coaching and physical education contexts, assists state and national organizations in writing and assessing physical education standards, and teaches future physical educators and coaches. Additionally, Dr Grant serves on advisory boards and evaluates teacher certification portfolios regarding planning, instruction, differentiation, and assessment.

**Samuel R. Hodge**, PhD, is a Professor of Kinesiology in the Department of Human Sciences, College of Education and Human Ecology, The Ohio State University. Hodge's research converges on issues of diversity, disability, and social justice in education and sport. He is a noted scholar and a *Fellow* in the National Academy of Kinesiology, the National Association of Kinesiology in Higher Education, and the Research Council of SHAPE America. In 2017, Hodge received the *G. Lawrence Rarick Research Award* from the National

Consortium for Physical Education for Individuals with Disabilities (NCPEID), and more recently, he received NCPEID's 2021 Hollis Fait Scholarly Award.

**Larissa Jakubow** is a doctoral student in the Educational Psychology and Educational Technology program at Michigan State University. She currently serves as the learning specialist for Gonzaga College High School in Washington, DC. Her research interests include social studies curriculum, primary source documents, and students with high-incidence disabilities.

**Stacy Kelly** is a Professor in the Visual Disabilities Program at Northern Illinois University. Kelly has published and presented extensively on the topic of assistive technology for students with visual impairments.

Larissa Lemp received her EdD in Administrative Leadership from Shenandoah University. As a nationally board-certified Special Education Teacher, Larissa advocates strongly for inclusion across all settings. When not researching or teaching, Larissa enjoys hiking with her husband Ray. Their rescued senior beagles support their indoor interests, like reading and enology.

Holly Long is a third-year doctoral candidate in the Special Education Program at Michigan State University. Her research interests include mathematics interventions for students with autism spectrum disorder and implementing mathematics interventions in special education classrooms.

**Angi Martin-Prudent**, Ph.D., CCC-SLP/A, is a dual certified speech-language pathologist and audiologist. Her area of interest is young children with communication disorders. Her primary area of interest is parent coaching and parent involvement in the early intervention process, specifically intervention for children with hearing loss.

John William McKenna, PhD, is an Associate Professor of Special Education at the University of Massachusetts Lowell and is an affiliate of the Center for Autism Research and Education (CARE). His research interests include evidence-based academic and behavioral interventions for students with emotional and behavioral disabilities, responsible inclusion, and school–family partnerships. His service interests center on improving student access to empirically based instruction and intervention.

**Sunday Obi**, EdD, is a Professor and Program Director at Kentucky State University. He serves on the board of directors of New vista, an organization that provides outpatient services to nearly 30,000 adults, children, and families in 17 Central Kentucky counties. Prior to coming to KSU, he was a faculty member at both Murray State University (2 years) and Morehead State University (4 years). At Morehead State University, he played a major role in revamping the Special Education Program – the Moderate and Severe Certification and Learning and Behavior Disorder Certification. In addition, he received awards, honors, and recognition for excellence in teaching, scholarship, and service, as well as produced numerous students with undergraduate and master's degrees. Dr Obi was

the founder of the Work Training Program at the Central Virginia Training Center in Lynchburg, VA. He also taught students with EBD at secondary levels in Northern Virginia Public Schools Fairfax County, VA. In addition, Dr Obi has over 20 years of classroom and clinical experience working with individuals with disabilities. Dr Obi is the Initiator and Founder of the Master's degree in Special Education at KSU. He is a teacher, researcher, and scholar. He is the author or coauthor of more than 80 publications, including books, book chapters, and articles, and has presented papers at many national and international conferences. He serves on the editorial board of *Multicultural Learning and Teaching (MLT)* in which he serves as Executive Associate Editor.

**Kristen E. Obiakor**, MD, MS, is Resident Physician at Yale University Children's Hospital. Her research focuses on equity in medicine and innovative ways to maximize the life potential of children, especially those who come from culturally and linguistically diverse (CLD) and vulnerable backgrounds. Also, she mentors young people who are interested in the sciences (e.g., medicine).

**Robert Pennington**, PhD, BCBA-D is the Lake and Edward J. Snyder, Jr. Distinguished Professor in special education at the University of North Carolina at Charlotte. He has 30 years of experience working with individuals with disabilities, their families, and teachers and has published numerous articles, book chapters, and books related to working with person's extensive support needs (ESN). Robert has provided hundreds of presentations to researchers, practitioners, and families and values service to field through membership on numerous advisory and editorial boards, leadership in professional organizations, and consultation. His current research interests involve technology, communication, written expression, and educational programs for students with ESN.

Monique Pinczynski is a first-generation doctoral student at the University of North Carolina Charlotte in Special Education. She was previously a classroom teacher in Henderson, NV, where she taught students with autism and ESN as well as students with learning disabilities. Monique earned her BS and MEd in Special Education at the University of Nevada, Las Vegas, where she also attained her Board Certified Behavior Analyst certification. Her research interests include implementing evidence-based practices with students with autism and ESN with a focus on communication as well as supporting teachers in this area.

Jeremy Price (he/him/his) is an Assistant Professor of Technology, Innovation, and Pedagogy in Urban Education at the Indiana University School of Education-Indianapolis at IUPUI. Dr Price serves as the Primary Investigator and Project Director for the Digital Education Hub for Rigorous Remote Learning with Communities. As a public scholar-advocate, Dr Price is invested in building capacity and capital in educational settings for marginalized and minoritized youth and communities to build, strengthen, and sustain the democratic project. He works to prepare preservice and inservice educators to use technology for just, equitable, and inclusive purposes.

**Stephanie F. Reid** is an Assistant Professor of Literacy Education in the Phyllis J. Washington College of Education at the University of Montana. Previously, Stephanie was a middle-grade Language Arts and/or Reading teacher for 15 years. Stephanie's research focuses on how students make and interpret multimodal texts in K-12 contexts.

**Alicia Schmeisser** has supported the needs of students and school staff as a school social worker and an administrator. She is a student at Illinois State University, working toward a doctorate in special education.

**Shannon Stuart** is a Professor of Special Education who coordinates the Autism Spectrum Disorder Specialist Certificate at the University of Wisconsin-Whitewater. Her professional and research interests include supports for students with autism spectrum disorder, transition supports for students with disabilities, and school-wide behavioral supports.

**Kristine Van Handel** is a Board Certified Behavior Analyst with the Wisconsin Early Autism Project in Madison, WI. Her professional interests include training staff who work with children with autism spectrum disorder, supporting parents, and collaborating with schools and other agencies to provide beneficial services to children with autism spectrum disorder.

**Quentin M. Wherfel** is an Assistant Professor of Special Education and Program Director for Teacher Education in the Department of Education, Counseling, and Leadership at Bradley University in Peoria, Illinois. His research interests include access to the general education curriculum, assessment and decision-making practices, assistive technology, coteaching and collaboration, and intensive interventions and supports for individuals with disabilities.

### **PREFACE**

Students with disabilities are continuously facing challenges in our educational systems and programs. One area of focus that has been challenging is technology. For many years, the use of technology in the classroom for students with disabilities was nonexistent andthen, the focus was on the use of microcomputers and drill and practice activities. Over time, technology has become very important for teachers, parents, and their students with disabilities. Technology has allowed these students to be successful and have access to environments they previously could not participate in because of their disability. For example, during the global COVID pandemic that devastated the world, technology became the livewire of most societies. However, while legislation has mandated the use of technology for students with disabilities, school systems, teachers, and other professionals are sometimes slow to implement changes that will positively impact these students. It could be the training on the use of the technology, cost, or individuals just not being aware of certain technologies that could benefit the learning of students with disabilities. Providing the appropriate technology is definitely an area that has not been addressed to the level that it should for students with disabilities. This journey to improve the use of technology has not been easy for these students and their teachers and families. The use of technology for students with disabilities needs to be a primary focus in the future so students have positive school outcomes that will make them positive contributors for themselves and society.

This book, Using Technology to Enhance Special Education, Volume 37 of Advances in Special Education, is a logically, thoughtfully organized, and well-sequenced text. It focuses on how general and special educators can use technology to work with children and youth with disabilities. This cutting-edge book involves researchers, scholars, educators, and leaders who are knowledge producers in the field. It is written to respond to today's changing world where technology has become a very powerful force. As it stands, the world is getting smaller and smaller; and what is happening in a location quickly becomes known everywhere. For example, during the tense periods of the global COVID pandemic, technology became the livewire of our world. This book begins with an introduction to technology and students with disabilities; and the remaining chapters focus on the role of technology in the education of students with learning disabilities, emotional and/or behavioral disorders, intellectual disabilities, autism spectrum disorders, physical and health impairments, hearing impairments/ deafness, visual impairments, and traumatic brain injuries. In addition, some chapters focus on the role of technology in achieving equitable and inclusive education, building culturally and linguistically responsive general and special xvi PREFACE

education, and creatively using digital comics to improve written narratives. This book concludes with a chapter that addresses forward-looking ways to infuse technology in special education.

Even though technology is still rare in some disadvantaged communities, it is here to stay. As a result, it behooves us to use it to advance our future. And, for a brighter future, general and special education must continue to infuse cutting-edge technology in all programs to reach all students regardless of gender, socioeconomic status, cultural difference, ethnic group, disability, or health impairment. When used appropriately, technology can be a positive factor in students' learning, academic, or social processes. The use of computers and other technology must be thoughtfully planned to provide for students' growing needs. General and special education teachers and leaders should (1) develop policies about computer usage, (2) work with parents to provide technological guidance as needed, (3) allow students to be in control without letting technology (e.g., computer) to serve as the babysitter. To a large extent, technology must be used cautiously in special education to positively impact students, educators, and leaders, as well as educational systems.

We feel that *Using Technology to Enhance Special Education* is an excellent resource for special education researchers, scholars, practitioners, and professionals who teach and serve students with disabilities. This book is of great benefit to those teaching required undergraduate and graduate special education courses and those engaged in research on technology for students with disabilities. It can also serve as an excellent supplementary text for advanced students who are looking for detailed, comprehensive, and current information for their research papers or theses.

Jeffrey P. Bakken Festus E. Obiakor Series Editors