Preface

ORIGINS

As I write this, my personal and professional experiences appear to have led logically to this point in time. Yet the path to this point was not so clear to me as I lived it. Like many in this emerging field, I have come to games and learning via a circuitous route. My background is in psychology (undergraduate), creative writing (undergraduate and graduate), and instructional design and technology (Ph.D.). To start with, I was never much interested in technology (perhaps because my father was a systems analyst in the 70s, and nothing your parents do is “cool”); nor did school engage me, for that matter. I preferred reading science fiction to doing homework. When I was in middle school, however, my father brought home Cave/Adventure (http://www.rickadams.org/adventure), and my brothers and I played it nonstop on our Heathkit H-8 computer. Technology became relevant for me because of this game, although I learned just enough about the computer to run the game. The time and effort I put into winning (including mapping that infernal maze) far exceeded my school experience in both work and reward. For the first time, I recognized something I enjoyed as much as reading but which also seemed to me to be even more relevant to learning. It was reading that convinced me that learning could be engaging and games that showed me that hard work could be engaging.

This realization was not an epiphany so much as the germination of my general belief that school should be more interesting and challenging. In 1976, however, it certainly did not feed into my career plans; games were played (for the most part) in arcades, and while I spent a good share of my teenage years in Flipper McGee’s and Mickey Rat’s pinball arcades in Ann Arbor, the idea that my interests could somehow lead to any kind of career choice not only did not cross my mind but would have been greeted with ridicule had anyone suggested it. By the time I went to college, I was interested in understanding how humans think and behave; creative writing was something I did because of my love of reading. In retrospect, of course, both of these areas have a lot to do with games and with making education more relevant and engaging.

At the end of my master’s program in English, I took on the editing of a publication of student work from composition classes. The process that had been used (literally typing up stories on camera-ready blue sheets) seemed antiquated and inefficient even to a technology neophyte like me in 1991. I asked my dad what he thought, and he suggested I look into Adobe PageMaker (4.0) instead. For the second time in my life, technology became relevant to a problem I had to solve, and once again I taught myself just enough to solve it. I graduated the next year and began applying for English teaching positions. As it turns out, a college in the Southwest was looking for a Media Arts and Communication Program Coordinator to advise the student newspaper and student magazine and teach both English and desk-
top publishing. I was hired primarily because I was the only candidate able to successfully complete a
desktop publishing task using (you guessed it) *Adobe PageMaker*.

Technology became a major part of my professional focus, and I learned a lot about technology in
the following years there, which culminated in the creation of a multimedia authoring lab for faculty to
develop multimedia. My interest in making learning more engaging and challenging now had a place in
the work I did, and I wanted to show faculty how to build multimedia. But I felt I was missing something
significant; how do you know if what you’ve developed is effective? What theories and principles exist
to guide the development of multimedia? I started looking for graduate programs in multimedia and
computer-based training and eventually found my way via educational or instructional technology to the
field of instructional design. In contemplating returning to school, I knew I would have to do research
(which I was not excited about) and began thinking about what I could study. I had continued playing
games all through graduate school, and I realized that the gap between multimedia and games was small:
if I could reasonably study the one, the other was also a viable research area.

I had one question of the programs to which I applied: Would I be able to do dissertation research on
the educational potential of digital games? In 1995, only one program I approached—at the University
of South Alabama—that was a potentially productive line of research, so that is where I went.

My initial search for graduate programs was my first indication that technology and pedagogy were
not the same thing and that what I needed was not technology but learning theory. You can learn a given
technology and know nothing about how to use it for learning, but if you know how people learn, you
can teach yourself a technology and be well on your way to designing effective learning. Applying this
lesson to games was another matter, however. I spent much of my time in graduate school struggling to
identify “the” theory behind games. Because instructional design is itself interdisciplinary (education,
psychology, communication, and technology), many of theories I found were applicable to learning in
games and formed the basis of my dissertation: situated learning and cognition, anchored instruction,
context, pedagogical advisement, transfer of learning, problem solving, and motivation. No single
discipline had all the answers, and while a few researchers were doing direct measurement of video
games and learning (Cognition and Technology Group and Vanderbilt; Patricia Greenfield at UCLA;
Mark Lepper at Stanford; and Thomas Malone at Xerox Palo Alto Research Center), most of my work
required synthesizing what was being done in multiple fields of learning research to formulate a con
ceptual framework for the design of my own game to promote transfer of mathematics skills.

The research I did during this time was instrumental in formulating my beliefs that the answers to
complex questions can best be found at the intersection of disciplines rather than within them, a concept
one of my mentors and colleagues, Art Graesser, later would refer to as a “fish scale model,” based, I
believe, on Don Campbell’s chapter “Ethnocentrism of Disciplines and the Fish-Scale Model of Omni-
sience.” The lesson I learned in the process about the need for interdisciplinary awareness in the study
of games and learning has never left me, and remains as critically relevant to game studies today as it
was to the design of my own educational game in 1999.

**WHY INTERDISCIPLINARY?**

As I write this now, I am struck not only by how much progress we have made in this field but also by
how far we still have to go. And that is why this book exists. Over the last decade, no one can deny
that this field has made significant strides in public opinion, theory, and practice. It is now commonly
accepted that games have SOME benefits, whether or not one believes games have a place in formal education or that the benefits outweigh the risks. This is a far cry from the shock Patricia Greenfield’s assertions were met with in 1984 and from the reaction to Marc Prensky’s assertions even 16 years later. That games can educate is no longer the radical notion it once was, and the growing canon of research in this field is no longer possible to capture in the space I have here.2

Yet as much progress as we’ve made, there are significant gaps in our praxis. This is partly due to the youth of our field and the need to establish new theoretical models and concepts. But it is also because too many have approached this field as if it were a completely new area of study with no theoretical antecedents in other disciplines. This is perhaps a natural progression for any new field, but it nonetheless presents one of our most significant challenges. It is time we stop and take notice of the work that different disciplines are conducting, to explore new ideas and approaches that perhaps have been overlooked and to attempt to synthesize multiple theoretical approaches relevant to the field. Some of the work that is going on in this field is unknowingly duplicative because of different terminology, publication venues, and readerships; integrating these different studies will allow us to see patterns instead of discrete findings. It will also allow us to identify areas that need further study and perhaps new theories that are attributable to the medium and amalgamation of different theoretical approaches.

Perhaps most importantly, we have to make sure that those entering this field understand that video games are still a somewhat new technology, not (necessarily) a new pedagogy. To be sure, we have uncovered new learning strategies, outcomes, and principles, and we will continue to do so. But we cannot tell the difference between what is new and what is existing theory wearing a new face if we don’t understand how existing theories are instantiated in games. While the serious games field itself is interdisciplinary, that does not mean we take full advantage of each disciplinary perspective where and when we address it. Whether because of a lack of expertise or awareness, we at best use theory and practice from other disciplines to support minor points and perspectives.

My hope is that by making interdisciplinarity the focus of a work on games, we may find important distinctions and profit from prolonged critical analysis and application. If nothing else, we perhaps become more consciously aware of the breadth and depth of interdisciplinary practice within the growing field of games.

ABOUT THE BOOK

The chapters you are about to read are unique, in some cases because authors who don’t always write about games have brought their specific disciplinary focus to bear on the topic and in others because authors who do write about games have made a specific effort to bridge disciplines. The result in all cases, I believe, is both unique and valuable. The chapters represent 13 different disciplines (digital culture, digital media, rhetoric, communication, educational psychology, literature, theater, sociopsychology, instructional design, instructional leadership, educational administration, library science, and game design), not counting various flavors of psychology and media studies, by authors from five countries (Australia, Belgium, Finland, Ireland, and the United States of America).

Many of the ideas that are dispersed across multiple disciplines are easily missed when viewed across different venues. But contracted together within a concentrated space, they become visible and are thus able to inform us in important ways, much like gas molecules in space produce nebulas when concen-
trated. It is of course challenging to capture different disciplinary perspectives: cast too wide a net, and you'll capture too many disparate ideas—too narrow, and you'll get too much of the same thing.

Much of what you will read in these chapters will be familiar in focus but will differ widely in language and perspective. I urge you to read closely because what at first glance seems familiar to you may in fact differ in important ways because of the disciplinary perspective it comes from. Interdisciplinarity is highly challenging, and even confrontational—much of what we do when we read is assimilation, but accommodation is the heart of human development, and no field can grow without it. It is my hope that you will find much that you like and recognize here but more that is unfamiliar and difficult; if it is not challenging for you to read, one or both of us may have failed.

Each chapter is the result of an original proposal, each of which was reviewed by three peers in a double-blind review process. In doing so, I assigned reviewers chapters based on interest, expertise and, in the case of reviewers who were also authors, on the potential of the authors to benefit from a different disciplinary perspective on work similar to their own. Based on these proposal reviews, some authors were invited to submit full chapters, which were again reviewed using the same process.

Based on my readings and those of the reviewers, I have organized these chapters into five sections: Genre, Classification, and Definitions; Theoretical Perspectives; Research; Theory Into Practice; and Future Directions. These sections loosely reflect my beliefs about disciplinary process, in that each relies on its predecessor and informs its descendant. The first section in this book focuses on language and terminology for what we mean by games and related concepts. The second section discusses theories from different disciplines that can inform research and design for educational games. The third section presents research that both adds to our understanding of games and serves as a model for future research on theoretical constructs and models. The fourth section comprises chapters on how theory and models inform practice in the design of games for learning purposes, and the fifth section identifies two promising future directions for the field. Each author was also asked to generate a list of “must-reads” on their chapter topic for those who want to understand more about the theory and approach behind each chapter. In addition, they were also asked to identify what they would consider to be the most important texts for interdisciplinary studies of serious games. The “must reads” and top interdisciplinary text lists can be found at the end of each chapter, immediately after the references. I have also collated all of the authors’ top interdisciplinary texts across this book and a companion volume that collected the same information. I present this composite list sorted by rank and author at the end of the book. You will find both a short and long version of the table of contents, the latter of which provides my own summary of what each chapter is about, so I will confine my comments here in the preface to a discussion of each section of the book and how I think each chapter contributes to that section.

Genre, Classification, and Definitions

That this is a young field could be gleaned from nothing more than the inclusion of three different chapters in the first section, each attempting to define what games are from a different disciplinary perspective. Äyrämö and Koskimaa describe the results of their analysis of game designers’ implicit and explicit definitions of narrative in nine respective game design books, while Kallay and Sherlock each attempt to propose new game classification systems based on, respectively, narrative psychology and rhetoric. Game classification is perhaps one of the most generative research areas in games right now, as we struggle to reduce the overlap and illogicality in competing definitions and systems. Language allows
us to think differently about our subjects and is arguably foundational to our ability to develop theory, models, research, and practice in any discipline, so this is far more important than a tomato/tomahto argument. While many researchers are naturally attracted to the design of new games or the study of existing games, without a precise language to describe our practice, theory, and results, our research and design will proceed in a fragmented and duplicative fashion that leaves little potential for synthesis.

Theoretical Perspectives

The three chapters that make up this second section are divergent in topic and approach, and illustrate the power of looking to different disciplines to refine our explanations of phenomenon. Yanuzzi and Behrenhausen reconceptualize one aspect of what we often refer to in 21st-century learning as critical self-reflection. They illustrate the critical reasoning and theory-driven approach necessary to quantify and define our often nebulous descriptions of the benefits of game-based learning. At the same time, they point the way toward the design of future educational games. Low provides a similar treatment of the often used and misused concept of motivation in games. Her chapter pulls together some of the most significant research findings and definitions of motivation and learning from educational research, which should guide future research on motivation and games. Friedlander concludes the section with a fascinating amalgamation of theater, literature, and comparative religion that is in many ways reminiscent of Huizinga’s discussion of play and culture. He identifies a promising approach to the design of engaging, cross-cultural games that rely on sacred scenarios and in doing so illustrates why it is so important to seek out and synthesize divergent perspectives from different disciplines.

Research

Few would argue that there is a pressing need for research in this field, but this need exceeds our capacity for conducting it at uniformly high-quality levels. The authors in this section provide good examples of how research methodology and implementation must flow from sound theory, models, and practice. The findings themselves are of interest and importance to the field, but the chapters are perhaps at least as significant for promoting high-quality future research. Jin describes a variety of strong research methodologies, the questions they are best at answering, and examples of research on games that reflect these methodological considerations. Sharritt, in his chapter, and Mailliet and Martens in theirs, propose two different models from different disciplines that they then validate through research. In addition to making important contributions to the field now, their chapters also serve as case studies for the generation and validation of models for the study of human interaction with games.

Theory Into Practice

Theory by itself is of little value outside of academic circles; it must also lead to practice and real change. It is only through the application of our theories that we are able to test, validate, and refine them as we move toward becoming a discipline rather than a collection of ideas. What is sometimes lost even in this, is that practice itself gives rise to theory, thus perpetuating knowledge through a cyclical process. The chapters in this section illustrate this. In the first chapter, my coauthor and I describe current theory and research on the design of instruction to promote problem-solving skills, which are often cited as a primary benefit of game-based learning. We pull equally from games research and theory and instruc-
tional design to illustrate the variety of different problems that make up problem solving, the cognitive structure and thinking skills these different problems require, and the kinds of gameplay that may best support them. Wilson and Williams provide a rare, detailed case study of the application of existing game design models and processes to the design of an educational game in an academic environment. Gaydos and Squire illustrate the design processes associated with building an educational game that instantiates current thinking in science literacy and 21st-century learning. Together, these chapters illustrate how theory informs practice and how practice in turn informs theory.

Future Directions

While it could be argued that each of the preceding chapters suggests future directions for research and design, the chapters in this section have the potential to make a significant impact in our future practice. In their chapter on girls, games, and the role of libraries in digital game-based learning in schools, Farmer and Murphy highlight the need for systemic thinking when it comes to truly reforming educational practice. As scholars and practitioners of librarianship, the importance of this chapter further highlights how critical it is that our field looks to other disciplines for new approaches and ideas. In the final chapter in this volume, Chris Crawford brings more than 30 years of experience as a pioneering game designer and author to his analysis of interactivity as both a learning process and game design principle. The result has the potential to change game design in fundamental ways and could help educational game designers get over one of the most significant hurdles they face: how to build engaging games that support learning outcomes seamlessly.

A FINAL NOTE

I struggled to decide how to refer to this field in the title of the book, my discussion here in the preface, and in my coauthored chapter. Serious games is a powerful term because of its wide acceptance and its inherent ability to address one of the primary misconceptions about games: that they are frivolous entertainment and therefore have no place in education. The term is also valuable for its ability to encompass the wide diversity of games, including those intended to promote health, to persuade, and to achieve educational outcomes. On the other hand, it is less useful in a volume like this where the focus is exclusively on games and learning. I am also troubled by the use of the word “serious,” which implies that there are games that are frivolous. Terms like this are more the reflection of the intent of the game designer or the player during gameplay than of the game itself. Commercial games are quite serious in their cognitive and emotional outcomes, and serious games as a term relies on what Sherlock refers to in his chapter as “definition-through-negation.” This creates a challenge for our field in terms of classification, genre, and definition.

My preference is for the term digital game-based learning in reference to the kinds of learning discussed in this book, as the term captures both the medium (digital game as opposed to other kinds of games) and the full range of implementation of games as designed instructional experiences, as environments that can support learning outcomes, and as a continuum of integration within existing formal and informal school settings. But the purpose of this book is to solicit multidisciplinary perspectives that inform our field, not to discuss what the field itself should be called. There is no question that the label “serious
games” has caught on equally with practitioners, researchers, and the public, and its value in bridging audience perhaps outweighs its drawbacks. It did so to the extent of titling this volume, in any case.

My hope is that you will find the different perspectives represented here as fascinating as I do both for the ideas they present and as evidence that theoreticians, researchers, and practitioners must make a conscious effort to look to other disciplines as we strive to advance our field, no matter what we call it.

*Richard Van Eck*
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**ENDNOTES**

2. See Bernard Perron and Mark Wolf’s *The Video Game Theory Reader* 2, 2008 (Routledge) for what may be the best and last reasonable attempt at identifying the field’s most important works and which is now out of date less than a year after publication.