Incommensurate Wor(l)ds: Epistemic Rhetoric and Faceted Classification of Communication Mechanics in Virtual Worlds

by

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Abstract

Brummett’s ontological view of epistemic rhetoric frames a world in which reality is truly only shaped once it is communicated. This reality creation is uniquely performed within online spaces that are separated from the physical world by means of programming code and internal culture. These spaces are constructed of language and constitute new realities (Chesebro) which are fundamentally rhetorical. However, the study of these tools lack shared terminology with which to classify and understand their potential as educational spaces. This study explores connections between communication mechanics of multi-user social technologies and their effectiveness as teaching tools. The study focuses on virtual worlds (defined as WAN-based, persistent, multi-user spaces which include avatars), such as Second Life and World of Warcraft, as examples of multi-user social technologies because these tools converge mechanics and communication tools found separately elsewhere. Communication mechanics are operationalized as facets found through the application of Shiyali Ranganathan’s Faceted Classification method. The facets of seventy worlds are first identified. These facets are then used to describe typical uses of the facets through Activity Theory (Engeström) and Genre Ecology Models (Spinuzzi). Finally, a framework is suggested for selecting virtual worlds and the most effective activities within them by ensuring
coordination among the strategic, tactical, and operational goals and activities of the tool, the course/instructor, and student.
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For Shane: You started me down the road. I only wish you could have finished with me.
Chapter 1: Incommensurate Terms, Incommensurate Practices

We live in a digital age in which technology is developed, distributed, and accessed at speeds never before seen in history. When Intel founder Gordon Moore correctly predicted in the 1960s that the capacity for computer processing and memory would double every two years, no one could anticipate the social and cultural impacts that such rapid development would bring with it. Today’s most basic cell phone has over a thousand times more processing power than did the early mega-computers of the 1960s. Even more important than the power of such technology is its accessibility; no longer in the hands of a few computer scientists, today’s advanced technologies are affordable and integrated into our everyday lives. Moreover, they give us far more than the ability to crunch data; they connect us. Manuel Castells described the impact of the greatly increased access to information and to each other that our networked world offers:

As soon as new information technologies diffused, and were appropriated by different countries, various cultures, diverse organizations, and miscellaneous goals, they exploded in all kinds of applications and uses that fade back into technological innovation, accelerating the speed, broadening the scope of technological change, and diversifying its sources. (6)

Although humans have established social networks as long as we have existed, never before have those networks included such a vast array of global connections to
individuals and information, and never before have those networks developed as quickly or as dynamically as they do now due to social technologies. The tangible manifestations of our networked world range from ubiquitous access provided by broadband, Wi-Fi, and smart phones to software that has become deeply integrated into our lives in the form of email, text messages, and social networks. These tools have changed the ways we connect to the individuals in our lives, discover new information, and see the world around us.

Given the great impact that personal technology has had on our lives in general, it is no surprise that it has greatly impacted our education systems. As chalkboards have evolved into smart boards, notebooks into netbooks, and encyclopedias into databases, the classroom and its technology has greatly changed. Indeed, they have changed to such an extent that some students no longer enter a physical classroom. For those students who want to learn but cannot or simply choose not to share a physical space with other students, their options have expanded from correspondence courses via postal mail to interactive, synchronous online courses accompanied by services ranging from virtual office hours with the instructor to shared collaboration spaces with fellow students. Technology has allowed distance education, and even classroom education, to move from a one-to-many model with the instructor coordinating learning from the middle to a many-to-many model in which communication among students is an integral as is communication with the instructor.

Those born in the United States within the last 20 years cannot recall a world in which the Internet was not accessible on a regular basis in their everyday lives. Those
born within the past decade cannot recall a world without Google. Throughout these years, the introduction and development of such technologies has been disruptive to educators but also exciting, with scholars from every discipline becoming increasingly willing to embrace opportunities to leverage emerging technologies to aid their research and to engage their students. These new technologies offer educators the means of reaching and teaching students wherever they are in new ways that are effective and exciting. However, technological advances move quickly, and often too quickly for educators to keep apace. To address such a challenge, educators must identify a means of rapidly gaining understanding of emerging technologies, evaluating a tool’s potential and effectiveness in a course, and sharing best practices and research findings.

New technologies pose challenges not only due to the rapid speed of their development but also their multidisciplinary nature; as the research related to these tools develops within a variety of fields and uses varying terminology, it often lacks cohesion or explicit connections to other fields and findings. This study aims to address this challenge within one family of technologies, the family of virtual world (VW) technologies, by developing a prototype approach to classifying these technologies using a shared terminology that will assist in the use of these technologies for educational purposes.

**Purpose of the Study**

Ultimately, the processes of teaching and learning are rhetorical. One does not truly know what one understands until one puts it to use, tests the concept against
one’s experience in the world, or shares it with another person, as information is conveyed, shared, tested, and gathered through communication with others. As a result, rhetoricians are the best suited to tackle the task of developing a method to classify technologies for education.

This study consists of four phases in the course of achieving its larger goal of developing a prototype approach to classifying VW technologies. First, it develops a common definition of VWs, which serves as an important foundation for the remainder of the work. Second, it describes the concept of faceted classification to demonstrate how this method provides a means of both distinguishing VWs from one another and connecting facets to the communication modes that they make possible, and then applies the method to identify the mechanics common to VWs. Next, the study will argue that these modes create genres which are an integral part of understanding the activities which take place in VWs, both designer-provided activities as well as user-created activities. Finally, using activity theory (AT) and genre ecology modeling (GEM) in combination with the facets, a heuristic will be developed to assist educators in developing the most effective educational activities within a particular VW.

As it progresses toward achieving these aims, this study fulfills the following goals:

- Create a common definition and shared terms to refer to VWs
- Provide a method for VW researchers to refer to and understand the mechanics of a specific world and create a more cohesive conversation
• Draw attention to the importance of rhetorical functions in the educational applications of multiuser technologies.

• Offer the beginning of a more accessible and effective way to choose and implement new technologies for learning.

The guiding question of this work is this: How are the communication mechanics of multiuser technologies related to the educational potential and effectiveness of these technologies?

**Significance of the Study**

There is currently no standardized means of classifying technologies other than by their designed purpose. For example, all chat programs, such as AOL Instant Messenger and Google chat, are categorized into the broad functional category of chat, a practice that does not allow for differentiation among the various programs according to their subtle differences using terms that assist users in determining their use in an educational or research setting. Although some educational technology professionals refer to systems such as Bloom’s Technological Taxonomy to categorize tools, such systems refer only to the types of cognitive applications for which a tool may be suited. Currently, no standard, widely accepted system aids educators in identifying and determining whether a tool is best suited for a specific purpose or to guide the design of a learning experience using the tool. In addition, the literature demonstrates that there is a lack of shared terminology among the various disciplines who study such tools, including telecommunications, informatics, computer science, results in the publishing
of research findings using a variety of terms for the same tool that may be inaccessible among the various disciplines.

**Study Variables and Predicted Relationships**

The purpose of the study was to explore the relationship between the communication mechanics behind and opportunities provided by multiuser technologies and the technologies’ potential for educational use. To be effective, a study of this type must maintain as narrow a focus as possible; attempting to explore all technologies with educational potential would have an overly broad scope and result in overly general results. Based on this consideration, this study focused on the examination of VWs, a category of technologies whose use is becoming increasingly popular in educational settings. The reason for the selection of VWs as the focus of study is that they provide a variety of communication channels within one tool, such as text chat and audio chat, whereas other tools typically provide only one channel (Bell 15), thus allowing for the analysis of several channels within one tool. Therefore, a study of VWs can also include analysis of some of these channels and perhaps cover more ground than an analysis of a single-channel tool could provide. A discussion of the channels included within a VW can be found in chapter two.

This examination was based on the argument that, rather than other methods of choosing technology to best apply to an educational need, analyzing the genres represented by and dominant activities provided by a tool is the most effective means of designing educational uses for it and evaluating its educational effectiveness.
Conceptual Framework

This study was based on the assumptions contained within two conceptual frameworks. In accordance with constructivist pedagogy, this study was based on the assumptions that learning is the result of the exchange of information and that social interaction is a powerful source of meaningful learning. In accordance with epistemic rhetoric, this study assumed that because individuals exist within a world created through language, rhetoric is the means by which they express and share their reality; as such, there is no shared existence without communication. Each of these positioning paradigms is discussed later in greater detail.

Constructivist Pedagogy

According to the developmental psychologist Edith Ackermann (18), constructivism can be described as the theory of imagining new learning environments and constructionism as a situated and pragmatic learning theory that is easily extendable to other theories and tools. Constructivist pedagogy was selected as the framework of this study for several reasons. First, constructivist pedagogy was developed as an outgrowth of constructivism, an established, acknowledged learning theory. Second, although not without controversy and critics, the theory is currently at the forefront of current learning theory debate, where it is becoming more widely accepted as an established theory. Third, the theory is easily applicable to VW educational opportunities, and thus readily applicable to the study aim of examining how learning theories may lead to the creation of thoughtful VW learning experiences.
Indeed, as VWs are by definition imagined new environments in the sense that they are a new reality, the application of constructivism to VWs proved a good fit, as it allowed for the exploration of the connection between learning and the spaces in which learning occurred.

Finally, constructivist pedagogy is most closely aligned with my own theory of learning and the experiences I design. According to Ackermann, one’s theories of learning are deeply rooted in one’s “convictions on what it means to be knowledgeable, intelligent, experienced, and what it takes to become so” (15). My conviction, like Ackermann’s, is that one-way idea transmission is ineffective in the classroom because the classroom is a complex, dynamic environment that requires different approaches within different contexts which aligns with the framework of constructivist pedagogy. The following section reviews the elements of this theory and related theories and their strengths and weaknesses to provide greater understanding of the framework upon which this study was based.

**Constructionist Learning Theory**

*Constructivism*, a theory based on the ontological and epistemological psychological theories of Piaget, has been applied to education by many scholars (Brainerd, Bodner, Ginsberg, O’Loughlin). Piaget proposed that individuals construct their worldviews based on their experience and bring that experience to bear on any new information that they encounter (Ackerman 3). Building on the constructivist theories of Jean Piaget, Seymour Papert developed the learning framework of *constructionism*, which he described as “the reconstruction rather than transmission of
knowledge”. He then extended it to the “manipulation of materials” based on his belief that the best learning results from “constructing a meaningful product” (Constructionism: A New Opportunity for Elementary Science Education). More specifically, Papert and Harel described constructionism as “demanding everything be understood by being constructed” (2), as constructionism is more than simply “learning-by-making” (6).

In his later work, Papert viewed constructionism as starting with the constructivist notion of “building knowledge structures” by the progressive internalization of actions (Ackerman 4). Based on the learning theory of constructionism, as well as the expanded base of distributed constructionism, he explained that individuals in learning situations create public entities that can be discussed and shared through electronic networks. Specifically, he postulated that constructionism adds to the constructivist grounding by creating public entities that can represent “that the learner is consciously engaged in . . . whether it’s a sand castle on the beach or a theory of the universe” (1). Ackermann described these public entities as tangible and sharable entities that inform students’ ideas and allow students to better communicate them to the instructor and other learners and thus “best support the exploration of what [the learner] most cares about” (4). Ackermann argued that these entities may act as more than cultural artifacts (like that of the social constructivist Lev Vygotsky) and become aids, most likely of a digital nature and relying on a higher level of initiative, that play a higher role in the development of the student (5).
To gain further understanding of Papert’s conception of constructionism, it is helpful to review the environments that have applied this theory, which not only expands understanding of the theory but also places it within the context of VWs.

Papert applied the theory in two main areas: Logo (a computer software program) and Mindstorms (programmable Lego toys). Papert wanted to teach mathematics to children using a teletype machine, a computer, a large flat surface, and a cybernetic toy called a “turtle” (Harvey 50). Through such means, Papert taught the children mathematics by having them work with objects rather than memorizing mathematical concepts by rote, thus instructing the students to consider mathematics concrete objects to manipulate rather than abstractions of ideas. Papert later expanded his teaching by instructing the students to use LOGO, which he described as not only a computer language but also a “philosophy of education” to learn by building rather than memorizing concepts (Logo Philosophy and Implementation vii). After reviewing Papert’s 1999 publication Mindstorms: Children, Computers, and Powerful Ideas, the Lego company engaged him to create tools with Legos.

Other researchers soon developed constructionist tools, such as computational construction kits, to “enable individuals to express themselves in ever-more complex ways, deepening their relationships with new domains of knowledge” (Resnick, Bruckman, and Martin 281). Built on constructional-design principles, these kits enabled the development of the personal and epistemological connections needed within constructionist learning environments. MIT Labs further researched constructionist science learning tools such as electronic bird feeders, marble machines, and a variety of
tools created with Lego bricks (Resnick, Berg, and Eisenberg). In 2004, Gromik used the computer program *Sim City* to teach English as a second language to Japanese high school students.

VWs expand the constructionist educator’s toolbox to include an almost unlimited supply of building materials. Although not tangible like Lego blocks, the objects within VWs are only limited by the imagination. Created at the Interactive Computing Environments lab at the University of Illinois of Chicago, the narrative-based immersive constructionist/collaborative environment (NICE) offers a virtual garden within a virtual reality environment within which to explore constructionist learning theories (Roussos et al. 62). Similarly, the VERTEX project allows elementary classroom students to construct objects in three-dimensional VWs (Bailey and Moar 21).

Focusing on constructionism in technological network environments and linking the theory to distributed cognition, Resnick et al expanded the theoretical base of constructionism to encompass the concept of distributed constructionism. Resnick described the three main distributed constructionist activities as those of *discussing constructions, sharing constructions, and collaborating on constructions*. Their expanded version of constructionism has been applied to research of VWs, and in particular of the VW *Second Life*. For example, Carina Girvan and Timothy Savage used distributed constructionism as the basis for their case study of *Second Life* by creating activities for VW students based on Resnick’s distributed constructionist activities.
Epistemic Rhetoric and Virtual Worlds

Being clearly of a different nature than political speeches, argument construction, and other common subjects of rhetorical analysis, VWs may appear an unusual focus for rhetoricians. In contrast, this paper argues that VWs should be primary targets of rhetorical analysis. Indeed, of all modern forms of communication, VWs appear most suitable for rhetoric scholarship simply because they are composed of rhetoric and discourse. Barry Brummett divided epistemic rhetoric into three arenas that together form a scale related to the extent to which rhetoric is believed to either uncover reality or create reality. He begins describing epistemic rhetoric as methodological, a view that postulates that rhetoric is merely a method with which to present alternate understandings of an existing reality or discoverable truth (1). Brummett next presented a social epistemic view of rhetoric that delegates rhetoric to a social rather than a material reality, explaining that by leaving the material reality and all its associated truths to the hard sciences, social epistemic rhetoric allows rhetoric to discover and create “reality and knowledge about reality in the social sphere of ethics, politics, morals, religion, etc” (3). Finally, Brummett proposed an ontological view of epistemic rhetoric based on the assumption that “rhetoric creates all of what there is to know” in a world where “discourse creates realities rather than truths about realities” (4). For the remainder of this paper the term epistemic rhetoric is used to refer to this ontological view.

If Brummett’s conception of epistemic rhetoric is accepted as ontological, it clearly encompasses the concept of VWs, which is a construct of language and
communication. VW designers write the programming language behind the interface to establish the possibilities and expectations, based upon which users construct themselves and perform actions within this constructed reality as a dialogue. Every avatar tweaked, every step taken, or chat initiated is a result of the user’s choice within the programmer’s framework. Because there is no nature, no default physics, or biological imperative, everything that occurs within a VW comprises a rhetorical act, regardless of whether actions are taken to accomplish a given task or perform a role.

Epistemic rhetoric argues that reality and language exist in a mutual cocreative relationship. Reality is perceived by the senses, which are interpreted through thought using language that shapes how one perceives and interacts with reality. As new realities, VWs offer spaces in which users create their own worlds—that is, their own interpretations of the real world as perceived by their physical senses—that can then become “known” to others through the artificial senses provided by that VW’s mechanics. Because programming languages create the virtual physical world from which VWs are constructed, these programming languages construct the basis for the user’s artificial senses and the forms of language and expression that can then exist within the world. VWs are, therefore, the epitome of the epistemic rhetoric; they are worlds in which users and their sensory systems are created and experienced purely by language. Whether the relationship that exists within a VW is the relationship among the programmer, the user, and the world or the relationship between two users and the world as their field of communication, the interpretation of the space perceived through the artificial senses constitutes a shared social construction of reality.
Beyond any other form of communication, VWs are constructs of discourse. Reader response theorists, such as Wolfgang Iser, Stanley Fish, and Louise Rosenblatt, have argued that when readers engage in discourse with a text, they create a reality that exists in the interpretation somewhere among the author, text, and reader, but that this reality is extremely limited when compared to the agency afforded to a user in a VW. Even Espen Aarseth’s concept of ergodic literature, defined as texts that require a significant effort on the part of the reader to consume such as “choose-your-own-adventure” novels and hypertexts, are not as participatory as are VWs. One does not simply consume and interpret a VW; one creates it and dialogues with it and with other users within it to further the development of a discourse-created reality on a scale never before observed.

Research Method

Before testing whether the application of communication mechanics is an adequate means of evaluating a learning technology, one must first identify and describe those mechanics. As later described in greater detail, this study employed Ranganathan’s faceted classification method to identify and describe the common mechanics that contribute to the most frequent forms of communication in an analysis of 70 VWs. After checking the facets against Louise Spiteri’s characteristics for functional facets, it then performed bivariate comparison of coexisting facets to identify common and uncommon combinations of facets within the worlds studied to ensure that
categories of worlds had not been excluded and that the sample was representative of existing VWs.

Limitations and Bias

The primary limitation of this study was that its scope was limited to the examination of the VW technology, which is but one of many technologies currently being leveraged for educational purposes. Although many other types of multiuser tools could have been examined, doing so within this study would have been impractical due to resource constraints.

The primary source of possible bias arose from my own personal perceptions. As a rhetorician, the author perceives every exchange as a form of communication, which may have led her to focus too strongly on how individuals exchange ideas using a tool rather than other characteristics that may be considered significant in other fields, such as how a tool is constructed or the political or social assumptions behind a tool’s design. However, given the aim of this research, my field prepares a researcher to approach the problem better than a scholar from a field that does not study communication.
Chapter 2: Background and Current State of Virtual World Technology

As a topic of study that crosses the boundaries of many disciplines, the concept of VWs has been examined through a variety of lenses using different methodologies and described using different terminologies. Establishing a shared definition of VWs and a common method with which to describe their mechanics will allow for the development of a more cohesive scholarly discussion and understanding.

Current State of Virtual Worlds

One can fly without wings or an airplane. One can fight armies of evil goblins or lead a group of loyal knights into battle. One can make friends from throughout the world with whom to share ideas without even leaving one’s desk. One do it all in a VW. Rather than passively watching television or playing a console game against a computer, residents of VWs choose to slide into alternate realities inhabited by other real individuals. In 2009 alone, 30 million individuals logged onto a VW to explore realms unlike any place they had ever seen before (Keegan). In 2007, World of Warcraft reported 8.5 million users, Habbo Hotel 7.5 million users, and Club Penguin 4 million users (Keegan). These users have started businesses, conducted research, or simply shopped for a great pair of shoes. In fantasy VWs, users have formed guilds with hundreds of members to take on challenges more complex than any that they have encountered at their workplace.

Although not yet mainstream, VW immersion has become widespread, particularly with the dramatic developments in immersive three-dimensional worlds and
massive multiplayer online role-playing games (MMORPGs) over the past few years. VWs are no longer fringe spaces only used by teenage boys and Dungeons and Dragons enthusiasts. Virtual social worlds such as Second Life have much broader appeal. Indeed, Gartner estimated that by 2012, 80% of active Internet users will have some kind of “second life,” meaning that they will have created an avatar, a virtual expression of themselves, in one or more immersive online spaces. As VWs increasingly enter the mainstream media, as has Second Life, which has been featured in the plots of popular television programs, what was once the domain of the few will be brought into the media environment of millions. VW immersion will become even more widespread as seeing a movie associated with an online game becomes increasingly more expensive than paying for one month of access to an online game situated within a VW. Indeed, users have spent more on obtaining access to World of Warcraft online than they have on seeing the season’s blockbuster movie.

Once a topic limited to gaming scholars, the concept of VWs has become a topic too large to be understood from only one field. Indeed, interest has surged in such a large number of VWs that researchers in the fields of media studies, anthropology, sociology, human computer interaction, education, and business are having difficulty identifying them in all their forms and variations. In 2008, The Social Sciences Research Network listed over 125 and the EBSCO database over 1,200 academic articles discussing VWs. Despite such research attention, researchers have not yet fully identified the attraction that VWs hold for their users. More specifically, they have not yet fully addressed research questions such as the following:
• Why do users spend so much time in VWs?
• Do users enter VWs to escape the analog world?
• Is VW addiction a real problem?
• How do users form relationships within VWs?
• Which literacy skills and information navigation methods are users developing within VWs?
• How does user-generated content factor into the attraction to VWs?
• How do game mechanics affect the VW experience?

Before these questions are addressed, the foundation on which VWs are built must be understood.

**Virtual Worlds as a Revolution**

According to Edward Castronova, individuals increasingly choose to interact within VWs rather than in analog spaces, leading to an exodus from the analog world that will have a great impact on many of its common structures, such as movie theaters and lecture halls, and the cultures that surround their use (xiv). He predicted that widespread immersion in VWs will initiate a social revolution that fundamentally changes the very basic elements of how humans relate to one another, entertain themselves, and earn an income. Representing both a social shift and a technological advance, VW immersion constitutes not only a social but also a scientific revolution. As a revolution is a dramatic break from that which occurred previously, one must gain understanding of the reality before the revolution and how the revolution altered it.
Virtual Worlds as a Reality

VWs constitute a new reality with its own truths and facts. Making this argument requires several steps which are explicated in the following sections. First, realities are defined using William James’ concept of the seven realities. Next, the eighth reality, media reality, coined by James Chesebro will be added. However, Chesebro’s concept of media reality does not account for more recent developments of interactive media (in which VWs exist). To gain understanding of how VWs form a new reality, one must first gain understanding of the concepts of interactivity, virtual reality, and cyberspace, all of which differentiate the media reality from VW reality. After establishing that VWs constitute a new form of reality, it becomes clear that there is a great need to develop a system with which to examine them.

The Eight Realities

To prove that VWs constitute a reality worthy of close scrutiny, one must first establish a common understanding of the concept of reality. In *Principles of Psychology*, James identified the following seven psychological realities:

1. The world of sense as expressed in the physical world.
2. The world of science as expressed in the mechanics, forces, and states of the physical world.
3. The world of ideal relationships as expressed in abstract truths and mathematics.
4. The world of “idols of the tribe” as expressed in illusions and beliefs common to the human race.
5. The world of the supernatural as expressed in mythology, fiction, and religion.

6. The world of individual opinion.

7. The world of madness and vagary. (292)

According to James, all experience and thought exist within one of these realities, each of which is defined by truths that often contradict experience yet are accepted within the reality. James explains that all experience, all thought, exists within one of these realities. The Christian concepts of Heaven and Hell, for example, exist in the reality of the supernatural, reality five. He explained that colors and music exist in the first reality because they are the results of sensory information; the concepts of gravity, atomic weight, and light waves exist in the second reality, the world of science; and that the paranoia and imagined voices that are truths within the insane mind exist in the seventh world.

As he described these worlds in the late 19th century, James could not have imagined the further realities that would be created by mass media and technology, such as those created by television and the Internet. Chesebro argued that such “media themselves constitute a socially constructed reality” (116), proposing an eighth reality to account for the truths present in television shows, film, and other forms of media. Drawing on the example of television news broadcasting, he explained that because editing, story selection, camera angle, and other factors unique to television create a different frame of existence for a relayed event, the reality experienced while viewing television news is not identical to that of experiencing an event firsthand. The television
footage of the January 15, 2009 landing of a U.S. Airways plane on the Hudson River, for example, was not equal to the experience of being on the plane or of being on a bridge nearby watching the plane land. Although the reality of the event as presented by a television news network reflected the selection of footage and facts available at the time, viewers believed that they knew what happened because they had observed, a version of the event’s truth. Thus, the reality of the media was the only reality for them, at least at that moment. As Chesebro concluded, “Electronic media in particular now constitute an independent and profound reality equal in power to the understandings generated by other socially constructed realities” (116).

Media Reality Lacks Interactivity

As Chesebro was defining media reality in 1984, interactive media was in its nascent forms. At the time, most media lacked interactivity. The concept of interactivity has been defined in a variety of ways. Whereas Chris Crawford defined interactivity as “a cyclical process between two or more active agents in which each agent alternately listens, thinks, and speaks” (Chris Crawford on Game Design 29), Jonathan Steuer defined it as “the extent to which users can participate in modifying the form and content of a mediated environment in real time” (46). In 1984, video games, for example, were primarily arcade games such as Asteroids (released in 1979) and Defender (released in 1980) in which users could take a limited range of actions. Although computer games such as King’s Quest and Zork were emerging at this time, they too allowed only limited actions and provided only simple text commands (“attack monster” for example) that were tightly defined and not open to user experimentation.
The most dominant forms of media in the mid-1980s were passive forms of media, such as television and film. Regarding the level of interactivity of the media at that time, Chesebro argued, “Audiences are discouraged from anticipating or recognizing ideological dimension in the electronic media” (122), while Monaco (as cited in Chesebro) described television and film, the most accessible forms of media of the time, as reflective of “others’ dreams, not ours, other’s worldviews and conclusions, not our own” (122). Technologically mediated interactivity was clearly at a nascent stage while Chesebro was developing his conception of media reality.

In the 25 years since Chesebro first proposed the concept of media reality, the media has become incredibly more complex, hypermediated (Bolter and Grusen), and interactive, allowing users much greater control over their media consumption. Media spaces such as video games have offered increasingly fluid experiences characterized by infinite range of action and multiple channels of user-to-user interaction. As Crawford explained, the media is now a much better listener, a much better thinker, and certainly speaks back in far more complex ways (Chris Crawford on Game Design29).

**The Role and Impact of Interactivity on Media Reality**

Interactivity, the cyclical experience described by Crawford, can assume a variety of forms, depending on the technology involved. Based on theories of transactional reading and reader response, which define a space between the reader and the text in which interpretation occurs, Iser, Fish, and Rosenblatt all described interactivity in terms of a transaction occurring between the reader and the text. As a medium, a book is not interactive because it does not think or react; the interpretation of a text is thus one
sided, purely on the part of the reader as he or she engages the text. In this limited sense, watching television is a similar experience to reading a book. Although viewers may react to an event described by a television program, the program does not react to their experience. Although the telephone device itself does not provide for interactivity, the use of the telephone offers the possibility of interactivity, as telephone technology allows interaction within the cyberspace, the term William Gibson used to describe the ether in which telephone calls occur that facilitates an interactive experience. By connecting two thinking beings, any technology, including bulletin board systems (BBS), chat rooms, forums, and IRC, MOOs, and MUDs provides the possibility of interactivity.

While tools connecting users in shared media spaces were being developed in the early 1990s, the rapid development of graphics capabilities and hardware led to the development of new kinds of space, and ultimately gave birth to virtual reality. These spaces included multiuser dungeon/domains (MUDs) and MUD object-oriented domains (MOOs), such as AlphaMOO and LambdaMOO, which emerged with advent of the first stable network servers in 1990. Such spaces allowed users with only a computer and access to the Internet to gain access to VWs. Although these early (and continuing) efforts to create the ultimate sensory immersion depended on the use of hardware, such as goggles, body suits, and projection caves, to engage as many senses as possible, virtual reality as a concept cannot be reduced to hardware. In 1999 Steuer defined virtual reality as “a real or simulated environment in which a perceiver experiences telepresence,” which he defined as “the experience of presence in an environment by means of a communication medium” (36–37).
Thus, the understanding of the concept of virtual progressed from an understanding of the hardware involved toward that of the space between the user and the technology in which the user’s sense of “being there” meets the feedback provided by the technology in a loop between user perception and sensory feedback from the system. Adding the concepts of interactivity—the manipulation of a media space and the listen–think–speak loop—to the concepts of virtual reality and telepresence within a space in which users can interface not only with the system itself but also with one another leads to the development of a virtual world (VW). The mix of these elements thus creates a communication medium capable of creating another reality, or rather many realities.

**Why Virtual Worlds are Different from Other Interactive Media**

To understand the full impact of VWs as media, it is necessary to gain understanding of how they diverge from the forms that came before them. In 1986, Jan Bordewijk and Ben van Kaam developed the matrix shown in table 2-1 to classify the four patterns of communication that existed at that time.

### Table 2-1 Bordewijk and Kaam’s Matrix

<table>
<thead>
<tr>
<th>Distribution controlled by a central provider</th>
<th>Information produced by a central provider</th>
<th>Information produced by the consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>Consultation</td>
<td>Conversation</td>
<td></td>
</tr>
</tbody>
</table>
Prior to the advent of networked computers, most media, including television, newspapers, and films, fell into the category of transmission media. As users requested information from a central repository of information, databases created the possibility for consultation, whereas feeding information into a database or similar system allowed for registration, and the introduction of multiuser systems, such as BBSs, allowed for conversation. In the late 1980s, these four patterns of communication accounted for all technologically mediated communication.

MOOs and MUDs (which are considered VWs in this study) were the first spaces in which these four communication patterns occurred simultaneously, and VW technology was the first technology that included all four types of interactive media. Today’s VWs are merely more complex, more graphically immersive versions of the same communication model. For example, World of Warcraft, which was created by Blizzard Entertainment and has become one of the most successful VWs, constitutes a transmission medium because its software and servers are made available to users through controlled channels. As users interact in the world, they call up information from the game servers, allowing the world to react to the actions taken by the players. Thus, play within the world can be compared to a request from a database and considered a form of consultation. Meanwhile, the same servers are engaging in a form of registration by collecting information about the user’s actions and storing it as data.
about the character/avatar that the player uses. Moreover, as World of Warcraft, is multiuser, players can interact with one another via text chat to relay battle strategies and character information, or simply to engage in conversation.

**The Truths of Virtual Worlds**

According to James’ definition, a VW is only truly a new reality if it contains truths that are paradoxical or incompatible with the truths accepted in other worlds or realities. The combination of telepresence, immersion, and multiple users within VWs leads to the creation of several characteristics (“truths”) that differentiate VWs from other forms of interactive media, which are described in the following sections.

**Truth 1: Virtual Worlds Allow Users to Leave and Return to the Reality**

Unlike being in the analog world, users can remove their being (i.e., avatar) from a VW at will through methods other than death. Moreover, their being continues to persist in the VW even when other users are not there without detriment to that being; logging out of a VW simply causes the avatar to cease to exist until the user logs in again. Unlike leaving the physical world, in which one is truly unable to remove one’s being, as even death leaves behind a body and all its materiality, logging out of a VW causes the being to truly cease to exist, but only until logging in brings it back.

**Truth 2: Virtual World Users Contribute to the Reality by Constructing Their Avatars’ Stories**

Because they can perform actions, avatars allow users to create their own story within the story created by the VW producers. This form of storytelling can be seen best
on role-playing servers of massively multiplayer online role-playing games (MMORPGs) on which all players are expected to interact as their avatars’ characters rather than as themselves. Players in these spaces often text chat in accents and use specialized terminology created by the world’s developers. As others in a space construct their own experience, the story of the world constantly changes as their actions are added to the actions of others, contributing to the interactivity of the world itself.

**Truth 3: Virtual World Users Form Shifting Parasocial Relationships with Their Avatars**

As users imagine a relationship with their avatars that their avatars cannot reciprocate, they form a *parasocial relationship* with their avatars. As described by Donald Horton and Richard Wohl, a parasocial relationship is a “one-sided, nondialectical relationship controlled by the performer, and not susceptible of mutual development” (216). Having no feelings of their own and no autonomy, avatars act only when controlled by the user, but possess abilities and knowledge that the user does not possess; whereas an avatar in *Second Life* can fly and call material into existence with a wave of a hand, the user behind that avatar cannot. The shifting parasocial relationship simultaneously immerses the user in the space while repeatedly making him or her aware of the interface that he or she is using to interact with the avatar.

**Truth 4: Virtual Worlds Create Finite Spaces of Normative Technological Determinism**

According to Oliver Bimber and Ramesh Raskar, the normative relationship between technology and culture is cyclical, being part of a cycle in which new technologies create new social norms that require new technologies in a never-ending cycle (91). Nowhere is this cycle more clearly depicted than in a VW. The limitations of
the world (e.g., whether users can fly or change their appearance) directly influences the culture of the world, while changes in the mechanics directly contribute to the culture developed within the space. Meanwhile, the growing demands of that culture may require developers to augment the mechanics of the space or encourage users to create hacks or add-ons to fulfill the mechanical requirements of the developing culture.

This list of truths unique to VWs is likely not exhaustive, as the technology is rapidly developing, but suffices to illustrate that VWs are unique realities. Although the argument that VWs constitute a new reality can be made by identifying the differences between VWs and the technology and communication patterns that came before their development, identifying whether the development of VWs constitutes a communication revolution requires more investigation, as is provided in the following section.

**Kuhn’s Cycle of Scientific Revolution**

In *The Structure of Scientific Revolutions*, Thomas Kuhn provides a framework with which to understand technological shift and put it into perspective. Kuhn describes the process by which a scientific field undergoes a paradigm revolution as beginning when an accepted, agreed-upon paradigm begins to be questioned with more frequency as researchers uncover findings that do not agree with the field’s accepted “truths.” If these challenges increase to a certain level, those who believe that an alternative paradigm can explain these challenges use it to confront the previously accepted theory. If the new paradigm gathers sufficient momentum and a sufficient number of members
of the field accept it, this new paradigm replaces the old, and the field returns once again to a state of normalcy, as shown in fig. 2-1.

Fig. 0-1. Kuhn’s cycle of scientific revolution.

Kuhn’s cycle explains how fundamental scientific ideas change over time as researchers begin to challenge underlying beliefs after collecting conflicting evidence. However, the revolution related to VW research has taken a different form. Rather than working from the same paradigms, VW researchers have focused their attention on the same objects but from disparate points of view, as shown in fig. 2-2.

Rather than developing a body of challenges that would suggest a new paradigm, VW researchers continue to work from disparate foundations that prevent them from making progress within the field. These researchers do not even share a common vocabulary; indeed, even the definition of the term VW remains a point of contention.
Without a shared foundation, proponents of varied paradigms “fail to make complete contact with one another’s viewpoints” (Kuhn 147). It is as if their conversations slide past one another only occasionally snagging one another for purposes of disagreement or false comparisons.

It cannot be determined whether the development of VWs constitutes a revolution, or even whether it conflicts with previous paradigms, if there is no process by which to make this determination. The development of such a process begins with the development of shared definitions.

The Development of Terminology

One’s suppositions about reality and perception of and access to reality influences how one interprets and classifies the new. When encountering an object or concept new to one’s experience, one reacts to its novelty by comparing it to objects or
concepts with which one is familiar. However, this process is not unique to the individual; cultural and/or linguistic referents, stories, and the opinions of others who have already encountered the new object or concept may all influence or supersede the individual’s own experience. Even academic disciplines are built upon foundations of reality and collections of experience. Acting as knowledge makers, researchers attempting to explain a new phenomenon cannot help but see it through the reality of their field, perceiving, defining, and classifying it according to their discipline’s rules and viewing it through layers of personal, cultural, and disciplinary screens, thus making their understanding unique. As they do so, they form terministic screens, for, as Kenneth Burke explains,

\[ \text{We must use terministic screens, since we can’t say anything without the use of terms; whatever terms we use, they necessarily constitute a corresponding kind of screen; and any such screen directs the attention to one field rather than another. (Language as Symbolic Action 50)} \]

Kuhn explains that a surfeit of theories could actually impede researchers’ progress; as they cannot remove their discipline’s paradigms and assumptions from their approach to research and interpretation of data, their theoretical assumptions become nearly opaque screens. As the processes of understanding and defining are not individual experiences, terms must be developed that function as symbolic shorthand for a concept’s truth, as well as allow one to share a referred reality with others and/or agree on a shared idea. Without such agreement, discussions consist of nothing but
incommensurate ideas, and without shared definitions, no communication can occur among individuals.

According to Kuhn, “Proponents of competing paradigms practice their trades in different worlds” (150). Although VW researchers might not have conflicting paradigms (those that attempt to replace the existing paradigms in a field), they may come from fields with assumptions that clash with one another (Kuhn 150). Establishing bridges among incommensurate paradigms requires the development of transparent, easily understood, shared terms that are not based on biases and assumptions, as well as a taxonomy or classification system with which to refer to VWs that is as agnostic of discipline as possible. Once developed and accepted, this shared terminology and taxonomy will make connections among researchers and research fields clearer and more meaningful.

**Challenges in Researching Virtual Worlds**

As online multiplayer games and immersive social environments have become more advanced over the past decade, they have increasingly become the focus of researchers. Borrowing from the fields of sociology, psychology, and communications, researchers have applied preexisting methodologies, such as ethnography (Turkle), rhetorical analysis (Squire), and participant observation (Gee), to study the spaces and the interactions within them. However, these methods are limited to studying the communication itself, and do not allow for analysis of the mechanics of the environments that give rise to communication patterns (Consalvo and Dutton;
Manninen; Squire). Truly understanding the new ways in which individuals communicate in virtual environments requires observing the entire picture; viewing any one element in isolation provides only a fragmented and inaccurate view of the communication that is occurring.

A primary challenge in investigating VWs is the ever-shifting nature of VW technology. Virtual spaces do not follow a prescriptive pattern of development. As is required to succeed in the market, each new environment boasts new developments (e.g., avatar customization and object creation) and channels of communication, all of which complicate understanding of what is occurring within the spaces. This difficulty is compounded by the fact that the current methods used to categorize communication are not capable of shifting with changing technology.

Examining the forms of communication that occur within these spaces requires less focus on what has been done and more on what can be done, which requires rhetorical thinking. One must consider the motives present in the gap between the laws (environmental mechanics made possible by the software of the environment) and the rules (norms and uses established by the developing communicative culture in a space), as it is this space between what is possible and what has been achieved that reveals the potential. Before doing so, one must gain understanding of the steps in the development of these spaces.
Growth of Virtual Worlds

Whether it is via the technicalities of language, nonverbal cues, written media, or digital forms, understanding the ways in which communication occurs is key to unpacking the meanings in the messages themselves. As most individuals have a good understanding of their mitigating mechanics, a rhetorical analysis of most forms of media is not required; newspaper coverage, for example, need not include a detailed explanation of the implications of black text on a white background. One functions under the sound assumption that, as Marshall McLuhan stated so well, “the medium is the message” (7). Therefore, when faced with a new medium of communication, one can only unpack a medium’s mechanics to examine the acts of communication that occur within the medium by gaining a thorough understanding of the medium.

With the advent of the personal computer and network technologies, human communication has moved into new forms at unprecedented speed. Although the speed at which technology has advanced has prevented many scholars from gaining a comprehensive understanding of VWs, most agree that the concept of a VW began with Trubshaw and Bartle’s development of the first multiuser dungeon/domain (MUD) in 1978 (Kelly). Referred to as MUD-1, their creation was the first that allowed a large number of users to share an experience, albeit a text-based one, within an imagined space. By creating characters with which to explore and socialize and using text to emote and act, users generated a sense of shared presence.
In the 1980s, the MUD experience became more visual with the advent of basic graphical spaces. Randall Farmer and Chip Morningstar developed Habitat, the first commercially distributed graphical MUD, which later became DreamScape and was bought by Fujitsu. Before Habitat, MUD users who wished to create custom content could only write a textual description of their character or of an imagined space. By providing them with basic graphical spaces, Habitat allowed users to create custom avatars from a selection of body parts, and even allowed them to decorate a virtual apartment with a selection of objects.

Later developments in immersive graphics, a hardware-driven concept referring to an immersive visual experience created by goggles and other sensory equipment intended to make the user feel immersed, can be found in virtual reality. However, VW technology moved away from hardware, which was cumbersome and expensive, to focus on the worlds themselves to develop spaces that offer usable tools and enjoyable experiences. Virtual became a term applicable to any technology that offered digital
Simulations of space and time, while the term *virtual reality* yielded to the term *VW*, only to become a term of contention and broad misuse.

Only recently has there been an effort to agree on a shared definition of *VW*, which requires standardizing the terms used by those in the fields of gaming, communication, and technology software and hardware. Early definitions, which were based on developments in contemporary software and hardware, were not sufficiently flexible to accommodate later developments. What is currently required are definitions sufficiently specific to be meaningful yet sufficiently wide to accommodate variations in technology, user motivations, and platforms. As gaining understanding of the contentious terms whose use scholars have debated within digital conversations and the points of disagreement among these scholars sets the stage for further study, this section describes several of these issues.

In December 2006, Timothy Burke posted an entry on *Terra Nova*, a well-known blog written by an international community of gaming scholars, in which he instigated a discussion regarding the history of VWs. Several dozen comments flowed in quick succession regarding the need to define what a VW was before a history could be established. Several referred to Raph Koster's *Online World Timeline* as the definitive source for the roots, and thus the common characteristics, of VWs.
However, tracing the important ideas that led to the development of MOOs and MUDS does not elucidate what these worlds have become. When, in the comments section of T. Burke’s *Terra Nova* post, Bartle pressed Damer to share his definition of a VW, Damer responded, “A text-based MUD is one, right? A first person shooter? A chat room? Second Life or Active Worlds? Better still, what is NOT a virtual world?” The discussion continued with many comments referencing other sources, offering up qualities that should or should not be included in the definition. After several days, the comments slowed and then stopped without the issue being resolved.

Six months later, Koster posted his definition of a VW: “A simulation of persistent space connected via a network, wherein users are represented by proxies often termed avatars” (*What Is a Virtual World?*). In response, commenters questioned whether the term *network* adequately describes a large-scale world and, because game worlds are so prevalent, whether a phrase should be added regarding game-playing or role-playing. Soon after, Grace McDunnough summarized her definition of a VW as a space for (a) socialization (b) immersive and participatory media, and (c) a marketplace. Her posting received a cold reception due to its emphasis on the content of the world and not the mechanics of its creation.

In 2007, Aaron Delwiche created a blog post entitled the “Four Traits of MUDS (and virtual worlds)” in which he listed the traits as follows:

1. Immersion in a synthetic world created entirely through computer-mediated representations.
2. User embodiment in the synthetic world in the form of game characters called *avatars*.

3. The copresence of multiple users in the synthetic world.

4. The ability of user-controlled avatars to make persistent changes to the shared world entirely as a result of their in-world behaviors.

Delwiche differentiated between game worlds and social worlds while acknowledging that they often overlap. Despite the specificity of his definition, the community reacted negatively to his inclusion of “persistent changes” because it excluded many social worlds in which users do not have the ability to build and/or decorate the world, as well as gaming worlds in which the changes that users can make are only temporary.

**Operational Definition of Virtual Worlds**

The fact that the debate regarding a definitive list of VW traits continues is a powerful indication of just how nascent the field remains. Must a VW be graphical? Must a space be inhabited by millions of users to be considered a “world”? The debate continues because the objects of study are often too diverse to be compared, preventing the scholarly discussions from assuming the form of meaningful conversation. Moreover, despite the increased publication of the results of VW research, especially into gaming spaces, over the last few years, the field remains sufficiently novel that scholars are still working with operational definitions that often differ from one study to another. To prevent any confusion resulting from such differences, this study defines a VW as consisting of the following four traits:
1. Having persistence: A VW cannot be paused; it exists whether or not a user is logged into it.

2. Being multiuser: A VW must be populated or at least have the potential for being populated.

3. Allowing for the creation of avatars: Rather than using an icon to represent a user, a VW allows a user to create an avatar, an agent that takes action. This representation of the user can perform actions that the user requests, such as fighting, expressing emotion, or simply moving through a space.

4. Being facilitated via a wide area network: A VW is facilitated via a wide area network rather than a local network. As they are free from the confines of and limited access provided by a locally hosted space, VWs have the potential to become global and very large.

Although these traits are necessary but not sufficient to characterize a space as a VW, it does serve to eliminate spaces that are not worlds, which allowed for the identification of spaces from the study sample that might have skewed the findings. For example, some scholars refer to spaces such as Facebook as a VW simply because they are online and large. However, the inclusion of spaces that fall outside this study’s operational definition of a VW, such as Facebook, would have prevented the facets developed in this work from being sufficiently concise to be functional. This definition will function as the operational definition for this work.

Examining previous research illuminates how scholarly analysis of virtual environments has been impeded by a lack of clearly defined communication mechanics.
Nick Yee conducted a survey of MMORPG players ($n = 2846$) from various MMORPGs (Everquest, Dark Age of Camelot, and Star Wars Galaxies) to explore how relationships form between players, the way in which players explore their roles in those relationships, and how those relationships impact the acquisition of new skills. Yee’s survey has a significant number of respondents from various MMORPGs (Everquest, Dark Age of Camelot, and Star Wars Galaxies) and yet, his interpretation of the survey results did not take into account the differences between the mechanics of each space and how those mechanics encourage, discourage, or complicate relationship formation and communication among players. When Sang Min Whang and Kim examined the results of a large survey of Lineage and Everquest players to compare their views of the games, they found that the users of one game were more engaged in the actual game playing, whereas the users of the other treated the gaming environment as a social space that simply happened to contain gaming mechanics. Despite this finding, they simply stated that the spaces were similar in terms of mechanics, and did not explain how the mechanics of each space might contribute to the differences in their use (787). Although studies such as Whang and Kim’s were not necessarily fundamentally flawed, their lack of discussion and consideration regarding the mechanics of communication in the spaces reveals a lack of richness in the discussions of the findings, and perhaps even in the design of the research itself. Each of the studies operationalizes VW in a different way. Thus, their findings are incommensurate.
Communication within Virtual Worlds

The research into VWs is often categorized with the research into gaming due to the fact that gaming has been the most prevalent manifestation of such spaces. Game studies is a complex field, consisting of those who study games (i.e., how play functions to motivate the player), those who study games as cultural artifacts (i.e., how games represent the culture that creates them), and those who study how games may be used for education and training. Despite their differences, they all focus on results of the game’s use rather than the game itself. That is, these studies neglect examination of the mechanics of the gaming environment as an object and the influence of the materiality of the space on the user and the communication products that result.

Added to this challenge is the fact that the line between a “game” and a “non-game” is becoming blurred with the development of new environments such as Second Life, There, and Multiverse. These spaces share common characteristics with MMORPG environments, such as World of Warcraft and Runescape, but contain elements not present in those spaces, such as freeform object creation, unlimited avatar customization, and stigmergic environments, defined as persistent spaces that can be altered by the user in ways that are visible to others. Aside from studying the elements of play involved in the puzzle-like nature of games, researchers have studied multiuser virtual environments (MUVE) to investigate the new communities, arenas of socialization, and cultures that all develop directly out of the forms of communication enabled by the environment. Just as the use of the telephone has informed and changed
speech patterns and as the use of e-mail has evolved to express emotion via emoticons, the use of various means of communication within virtual environments has affected the behaviors and cultures that develop within them.

**Communicative Action Theory**

Several researchers have begun to analyze the forms of communication present in virtual environments. Manninen, one such researcher, used Habermas’ Communicative Action Theory (CAT) as a framework to understand communication in virtual environments. Based on the assumption that all communication is social, CAT attempts to arrive at a mutual understanding between those who engage in six types of communication:

1. Instrumental communication.
2. Strategic communication.
4. Dramaturgical communication.
5. Communicative communication.
6. Discursive communication.

Habermas intended the CAT model to be used to categorize the purpose behind communication and the goals of the communicator (Manninen). Although Manninen’s application of CAT is useful in categorizing communication within VWs, it does not allow for description of the entire space. For example, Manninen described avatar appearance as a form of instrumental communication, as it is “the realization of a goal by selecting
just one action from a set of alternative actions”. However, in his discussion of appearance, Manninen considered neither the number of options available to the user nor the reasons behind the selection of a particular option, such as whether a user decides to “wear” armor to gain a distinct advantage in battle or merely to look more intimidating. In one setting, these choices can have more limitations, more implications, and more importance, depending on the function that the decisions serve given the mechanics of the environment. Determining the nature of the factors behind such decisions requires close examination of the mechanics of the environment that allows for choices or prohibits them from being made.

**Activity Theory**

According to Squire, Yrjö Engestrom’s activity theory can be used to explain how player communications are influenced by the environment, as it allows for consideration of a user’s interaction with objects in the environment and other members of the community (9). Specifically, activity theory proposes that “the minimal meaningful context is the dialectical relations between human agents (subjects) and that which they act upon (objects) as they are mediated by tools, language, and socio-cultural context” (9). Squire explained that unlike CAT, activity theory allows game researchers to understand the way the game “mediates players’ understandings of other phenomena while acknowledging the social and cultural context in which the game is situated” (10). However, activity theory does not consider the mechanics of the environment as a factor in the communication that results from an activity, and Squire presented no
means of examining how the environment acts upon the user. However, as is explained in chapter four, providing a more thorough understanding of the communication mechanics within a VW to Activity Theory provides a useful tool for the analysis of VW learning activities.

**Other Methodological Toolkits**

In another attempt to develop a method for understanding communication in virtual game environments, Mia Consalvo and Nathan Dutton offered a solution to the problems present in previous gaming studies, which they claimed had “taken two approaches—either studies of the audience for games or critiques of the games themselves” (1). Their approach treats the game as a text to be analyzed via the development of an (a) object inventory, (b) an interface study, (c) an interaction map, or (d) a gameplaying log, and its subsequent application to various games to test its usefulness. However, even an interface study that might be capable of analyzing the mechanics of an environment that allows for communication only treats the interface as a symbolic text that can be deconstructed to understand social and cultural beliefs woven into the game’s tools. Moreover, Consalvo and Dutton did not consider how one or more of their methods used together might illuminate how, for example, the interface mediates the use of the space, including how players communicate with one another.

Although the criticism of the studies described here is certainly not exhaustive of all criticism of VW research, it is representative of it. To the best of the author’s
knowledge, no study to date has considered the mechanics of a virtual space at the level necessary to gain understanding of its influence on a specific system. This study endeavors to fill this research gap by developing a taxonomy that can be used to describe and analyze the mechanics of communication in virtual spaces, whether they are gaming environments, collaborative virtual environments, blogs, wikis, or new spaces that emerge in the future.

This research is thus based on the author’s belief that the development of a thorough taxonomy is the best way to build a foundation for the field and a common ground for the discussions that will no doubt continue as these spaces become ever more popular and important in the lives of so many. Doing so is particularly important due to the fact that no currently used method of analysis can adequately begin scaffolding the differences among these environments, classify their mechanics to bring their differences and similarities into focus, or analyze the remaining elements of the environments and the lives that interact within them. The development of this taxonomy begins with a description of Ranganathan’s faceted classification method in the following chapter.
Chapter 3: Classification of Virtual Worlds

Faceted Classification

In the early 1930s, the Indian library scientist Ranganathan attempted to develop a library classification system that was more flexible than the widely used Dewey Decimal System, which was based on only 10 main classes, and would allow for the drawing of meaningful relationships between works beyond relationships between their subject areas. The result of his efforts was the faceted classification approach, an approach later developed into the Colon Classification system, a library system widely used in India and influential in the development of the Library of Congress classification system. Susan Herring described the faceted classification approach and its advantages as follows:

Ranganathan described the faceted classification method as analytico-synthetic: A subject domain is first analyzed into component facets, and relevant facets are then synthesized into combinations to characterize items of interest. . . . The flexibility of faceted classification lies in its ability to describe a large number of items with the subject domain, including novel items, on the basis of a relatively economical, pre-defined set of facets and terms. (6)

In a more detailed description of faceted classification, Spiteri described it as a process involving three planes: (a) the idea plane, in which qualities to be classified are analyzed; (b) the verbal plane, in which qualities to be used in the scheme are identified
and categories of qualities are created; and (c) the *notational plane*, in which the hierarchy or possible groupings of facets to be used within a notational system are defined.

Faceted classification is used to categorize and analyze objects such as data points, library books, and other objects that need to be easily sorted, compared, and differentiated. As such, faceted classification allows for the analysis of a large number of objects with varied attributes and their classification according to a scheme that permits their easy, meaningful comparison. For example, a Colon Classification representation for a book regarding English knitting techniques and wool production written in 1942 would be classified into the following categories: craft (main topic): needle crafts (sub area): knitting (specific craft): England (geographic): 1942 (year): wool (specific subject covered).

The usefulness of Ranganathan’s scheme lies in the fact that reference to of its facets, such as “England: 1942: wool” might yield other English knitting books from the World War II era, as well as articles and books about fabrics used for military uniforms or sheep farming. As shown by this example, the use of faceted classification directs users to associated information that they might otherwise have overlooked had the Dewey Decimal System been used, as faceted classification places each item in a richer context than a typical taxonomy and allows for cross referencing through common traits.

Limiting her research into faceted classification to the basic traits of *computer-mediated communication* (CMC), which she defined as the “medium (technological) and
situation (social)” (6), Herring aimed to provide a foundation for the addition of further facets that apply to chat, email, instant messaging, and other common forms of CMC. Herring also endeavored to create a system with which the communication itself could be classified by social purpose. Herring’s application of Ranganathan’s schema stopped short of developing conventions for naming types of objects (CMC arenas) through a colon classification label that might be used as a type of descriptive shorthand by others, an endeavor that this study undertook.

Although Ranganathan developed faceted classification as a classification system for libraries, this method has been applied and adapted to accommodate many different sets of objects since its inception. Many relational database systems developed to provide rapid access use a faceted classification approach to maintain a variable structure. The complexity, variety, and novelty of VWs have impeded the analysis and classification of the subtle differences among them and the manner in which their users inhabit them. Constructing a faceted classification of VWs would provide a means of examining the intricacies of the social interaction, learning, and other activities that occur within VWs.

**Facet Identification**

The first step in this research was identifying the environments that meet the definition of VWs provided in chapter two. The researcher reviewed over 70 worlds of various genres that had been developed in different countries and whose users greatly varied in their demographic characteristics to analyze the mechanics related to
communication contained within each world (see Appendix A). The researcher identified

the worlds by referring to lists such as The Virtual World Review

(virtualworldsreview.com/info/categories.shtml) and blogs such as Terra Nova

(terranova.blogs.com), Massively (massively.com) and Joystiq (joystiq.com), which are

considered reputable sources of information regarding the development of new VWs.

When possible, the researcher created an avatar within a VW to explore the world’s

mechanics, spent sufficient time within the world to experience the mechanics and

observe other users, and conducted casual interactions with more experienced users to

ensure that her perceptions of the mechanics were accurate. If creating an account for a

VW was impossible due to language barriers or expense or if no reliable account of the

world’s mechanics existed, the researcher did not include the world in this study.

Analysis of the traits of VWs allowed the researcher to identify the following six

characteristics shared by the majority of the worlds and all of which contribute to the

forms of communication possible within the worlds. None of these traits is external to

the world itself or unrelated to communication in the world.

1. Uses an operating system, whether a Mac, Windows, or Linux operating

   system.

2. Provides delivery media via download, CD, and/or DVD.

3. Provides external community communication methods, such as fan sites and

   discussion forums.

4. Delivers messages, such as system messages and status updates, to users

   from the company.
5. Supports multiple languages.

6. Specifies the number of groups that can be joined simultaneously.

The researcher compared the 10 traits to Spiteri’s guidelines for facets to ensure that they fulfill the requirements of a functioning classification system. According to Spiteri’s approach to classification, the facets should adhere to the following principles:

- **Differentiation:** “When dividing an entity into its component parts, it is important to use characteristics of division (i.e., facets) that will distinguish clearly among these component parts” (5).

- **Relevance:** “When choosing facets by which to divide entities, it is important to make sure that the facets reflect the purpose, subject, and scope of the classification system” (6).

- **Ascertainability:** “It is important to choose facets that are definite and can be ascertained” (6).

- **Permanence:** Facets should “represent permanent qualities of the item being divided” (18).

- **Homogeneity:** “Facets must be homogeneous” (18).

- **Mutual exclusivity:** Facets must be “mutually exclusive . . . Each facet must represent only one characteristic of division” (18).

- **Fundamental categories:** “There exist no categories that are fundamental to all subjects. . . Categories should be derived based upon the nature of the subject being classified” (18–19).
In her discussion of the verbal plane, Spiteri stressed that the terminology used in reference to the facets should adhere to standards of context such that “the meaning of an individual term is given its context based upon its position in the classification system” and standards of currency such that “the terminology used in a classification system should reflect current usage in the subject field” (11). Developing a functional list of facets is critical to classifying existing VWs and understanding those developed in the future. If the correct facets surface from the analysis described by Spiteri, the classification system that results will provide a useful and comprehensive means of describing any VW meeting the operational definition provided in chapter two.

The following ten facets and their subcategories meet Spiteri’s guidelines for both the idea plane and the verbal plane.

**Facet 1: Dominant Form of Content**

VWs originated as MOOs and MUDs within text-based environments before evolving (along with the technology) into visually immersive spaces in which text is only used for communication between users rather than as a mode with which to create the space itself. Although few of the spaces that currently exist are text based, the vast differences between these spaces and their visually based equivalents is critical and cannot be ignored. The following are the major categories of environments by dominant form of content:

- **Text-dominant environments**: These environments use text as the primary form of content. They may also use text to describe the environment, as do
MOOs and MUDs, and might contain images, such as user icons, but have little meaning without text. *LinguaMoo* and *LambdaMoo* are considered two of the most populated, longest living MOOs. Many universities still use MOOs and MUDs as teaching tools, as does Northwestern University with its *Diversity University MOO*.

- **Image-dominant environments**: Ranging from immersive environments such as *There* to *Disney Toontown*, these environments use graphics to convey important meaning in the space and cannot exist without the graphics. Text may be present in these environments, but it is always secondary to image.

**Facet 2: Dominant Form of User-to-User Communication**

Maintaining interactivity between users is a critical requirement for establishing telepresence in a multiuser environment. The ability to easily share information with others contributes to successful play in gaming worlds, as well as to building social ties between users through information sharing in both gaming and social worlds. The methods with which users communicate with one another influence how this information exchange occurs and its effect on cultural developments unique to the VW. The following are the major categories of environments by dominant form of user-to-user communication:

- **Text-dominant environments**: Text is by far the most common user-to-user communication tool in VWs. Users communicate via text systems, such as proximal text chat, and closed channels, such as instant messaging and group
chat channels. Worlds such as *FreeRealms* and *Club Penguin* offer modified
text chat that utilizes a preset collection of phrases rather than free-form
typing to ensure that minors who enter these worlds cannot share personal
information and put themselves at risk.

- **Voice-dominant environments**: If voice capabilities are embedded within the
  VW or if users can use third-party software to augment the communication
tools provided with voice capabilities, users communicate with one another
via voice chat, both public and private. Voice capabilities are most often
integrated into social VWs intended for business use (such as *ExitReality*),
but were recently added to *World of Warcraft* and *City of Heroes*.

- **Combination environments**: In some environments, users use both voice and
text, depending on the social situation.

**Facet 3: Level of Stigmergy**

A concept developed by entomologist Pierre-Paul Grasse to describe indirect
communication among termites in an insect colony, *stigmergy* refers to the ability to
manipulate an environment to communicate with others in a space, such as the ability
of ants to leave chemical trails to alert others of the location of food sources (Dron). In
terms of digital resources, stigmergy has been discussed in terms of exploring how
resources can be sorted and valued based on user reviews and evolutionary processes.
When applied to VWs, stigmergy refers to the ability to create lasting content. The
following are the major categories of environments by level of stigmergy:
• **Stigmergic environments:** In these environments, users can make changes to the environment that remain from one use to another. Multiuser stigmergic environments allow users to leave messages and other forms of communication for other users to find when they log in later. Examples of these environments are *Metaplace* and *Second Life*.

• **Nonstigmergic environments:** In these environments, users are unable to make changes to the environment or the changes that they make are reverted by the environment. For example, if a user logs off of *World of Warcraft* after defeating enemies who blipped off the screen, the user will find that those same enemies will have repopulated the environment after he or she logs in at a later time.

• **Limited stigmergy environments:** In these environments, users can craft unique items or combine a limited scope of materials, such as in worlds in which users may own houses (or similar private spaces) and decorate them with precreated objects.

**Facet 4: Level of Object Ownership**

Within each VW is a developing culture and economy based on the behavior and objects valued within the world’s system of laws. VWs that function like wikis by allowing anyone to edit anything at any time have a vastly different set of values and communication practices than do worlds in which all items are earned through battle or similar achievements. Differentiating between spaces in which users share resources
and spaces in which users compete for them provides significant insight into how and why users communicate within these spaces. The following are the major categories of environments by level of object ownership:

- **Private ownership environments**: In these environments, users can “own” objects (or data) and limit others’ access to them. In gaming environments, private ownership may mean that users have a private inventory of items that only they can access.

- **Nonownership environments**: In these environments, users cannot “own” objects (or data), and thus have no “inventory” of their own.

- **Shared ownership environments**: In these environments, items can simultaneously and equally belong to more than one user.

**Facet 5: Level of User Identity Formation**

In her discussion of chatroom and MUD users, Sherry Turkle provided initial insights into how users might be reinventing themselves using virtual spaces:

> The anonymity of MUDs—one is known on the MUD only by the name of one’s character or characters—gives individuals the chance to express multiple and often unexplored aspects of the self, to play with their identity and try out new ones. MUDs make possible the creation of an identity so fluid and multiple that it strains the limits of the notion. (12)

In an account of his own experiences in *Second Life*, Julian Dibbell described one user’s development of identity in a system that allows the use of infinitely customizable
avatars with which users could communicate via virtual bodies (241). Because avatars in such a system become a text to be read and interpreted by others, avatars that cannot be changed only allow users to communicate through more limited channels. The following are the major categories of environments by level of user identity formation:

- **Static environments**: In these environments, user identity is created by the environment and cannot be changed. Users have no choice of who they are as users, or have no identity at all.

- **Custom environments**: In these environments, users can easily customize their identity using the environment’s system. Environments such as MOOs and *There* allow users to augment their identity; choose their name; and create an identity through their clothing, objects, and persistent profiles. *Second Life* contains the most customizable avatars of all currently existing VWs.

- **Conditional environments**: In these environments, user identity develops through environmental variables, such as goals and status. When an environment only allows for conditional identity development, it often allows only customization with items that are earned or by users who have achieved a certain status. For example, in *Star Wars Galaxies*, users may only wear the armor intended for their character class, and changing certain attributes of their character’s appearance may cost so much money that less accomplished players may not be able to afford the services. In these
environments, character identity is often closely related to status according to the goals of the environment.

**Facet 6: Level of Environmental Access**

The manner in which access is gained to a VW not only controls who can utilize the space but also the number of users and the extent to which the space is exclusive or open. The following are the major categories of environments by level of environmental access:

- **Public environments**: In these environments, access is open to anyone and does not require the granting of permission. Even if access requires payment or the purchase of software, as do many gaming environments, the environment is still open to anyone who wishes to join by creating an account, purchasing software, or otherwise doing what is necessary to access the environment. Other environments merely require providing an e-mail address and completing a profile, as do MetaPlace and There. No permission is necessary to gain access to these groups.

- **Fee-based environments**: In these environments, access is open to anyone but requires the payment of a monthly fee, as do World of Warcraft and Warhammer Online.

- **Private environments**: In these environments, access is limited to those granted access through a special procedure, as do VWs in closed beta mode,
which are limited to invited participants, and spaces such as Second Life’s Teen Grid, which require background checks and other procedures.

**Facet 7: Nature of User Relationship With Other Users**

Whether the world is one of high fantasy, futuristic scientific technology, or contemporary life, an integral part of entering a VW is communicating with other users. As such, the ability to form friendships and alliances, as well as compete against one another as deadly foes, enriches the experience in VWs in powerful ways. The following are the major categories of environments by nature of user relationship with other users:

- **Collaborative environments:** In these environments, users collaborate with each other in a noncompetitive manner. Environments such as Second Life, where competing in battle and other aggressive forms of interaction must be agreed to by both parties and is not a required part of the environment, are also considered collaborative.

- **Competitive environments:** In these environments, competition between users is a required element and is part of the environment’s goals. Games in which players must compete against one another or lose through inactivity are included in this category. Some environments, such as sports games and fighting games, do not allow players to opt out of competition.

- **Conditional environments:** In these environments, users are collaborative or antagonistic with other users, depending on the situation. These
environments include games in which players may choose to fight enemies provided by the system or to fight each other in what are referred to as *player vs. player* (PVP) games. For example, players in *Star Wars Galaxies* and *World of Warcraft* may attack one another in specified areas of the gaming world.

**Facet 8: Nature of User Relationship With the Environment**

Whether peaceful and bucolic or gritty and dangerous, the user’s relationship to and immersion within a VW directly contributes to a sense of presence in the space and the reality of the world itself. The following are the major categories of environments by nature of user relationship with the environment:

- **Collaborative environments**: In these environments, users collaborate with the environment, which poses no danger to them. Wikis, blogs, and other environments not considered games fit into this category, as well as immersive spaces such as *Second Life* and *There*.

- **Competitive environments**: In these environments, the environment’s system provides enemies against whom the user competes. Most gaming spaces have antagonistic environments, typically manifested in the form of “mobs” of aggressive nonplayer characters, unless they provide for competition between users.

- **Conditional environments**: In these environments, users are collaborative or antagonistic with the environment, depending on the situation.
Environments such as World of Warcraft and Star Wars Galaxies often provide nonplayer characters who might assist players if that player’s “faction” points have reached a threshold level that “earns” the trust or support of nonplayer character population.

**Facet 9: Level of Access to Groups**

The presence of long-term, formalized relationships in VWs is more than an overt sign of committed friendships. Belonging to a long-term user-organized group makes social ties more concrete, especially in a world in which access to groups is acquired only by permission and/or earned. The following are the major categories of environments by level of access to groups:

- **Public environments**: In these environments, users may join any group.
- **Private environments**: In these environments, users can only join groups if invited to do so.
- **Nongroup environments**: These environments do not allow for the formation of groups.

**Facet 10: Number of Groups That Can Be Joined Simultaneously**

VWs may make membership in groups unlimited or restricted. Allowing membership in multiple groups leads to the formation of groups that are less formal and whose members are less committed to them, whereas limiting membership leads to the formation of groups that are more formal and whose members are more committed to them. For example, because Second Life does not limit group membership, many store
owners issue blanket group invitations to anyone who enters their stores, leading to the creation of informal groups. The following are the major categories of environments by number of groups that can be joined simultaneously:

- **Nongroup environments**: These environments do not allow for the formation of groups.
- **Single-group environments**: In these environments, users may only join one group at a time.
- **Multigroup environments**: In these environments, users may be members of multiple groups simultaneously.

**Development of a Notational System**

The final step of the faceted classification is to determine a notational system by which items may be referred to in a systematic manner. However, because this step is primarily intended to provide a file or storage system, this step was adapted to the purpose of this study, which was to use the faceted classification as a comparison scheme. Therefore, rather than beginning by determining a set order in which the facets should be listed as a description (i.e., moving from the most general to most specific facet when classifying each world), this study began by determining the most relevant feature of each world. Following Ranganathan’s nomenclature, the first facet was listed as a parent category, allowing for identification of the most important category as the parent category. For example, rather than classifying *World of Warcraft* as
in accordance with the listing of facets in table 3.1, the identity formation systems
within a set can be reorganized so that Identity Formation becomes the parent facet and
the other facets become secondary facets. World of Warcraft then becomes classified as
Causal >Single Group>Image>Multi-modal>No
nstigmergic>Private>Fee>
Situational>Scenario-based
and can easily be compared to another world with conditional identity formation to
better isolate their differences and similarities. This variable-parent approach makes the
classification more useful than simply sorting the items in the set.

Table 3-1 Results of Bivariate Comparison of VW Facets

<table>
<thead>
<tr>
<th>Form of content</th>
<th>-1 = text</th>
<th>0 = text and image</th>
<th>1=image</th>
</tr>
</thead>
<tbody>
<tr>
<td>User-to-user communication</td>
<td>-1 = text</td>
<td>0= text, voice and/or visual</td>
<td>1= voice</td>
</tr>
<tr>
<td>Level of stigmergy</td>
<td>-1 = no stigmergy</td>
<td>0 = limited stigmergy</td>
<td>1=stigmergy</td>
</tr>
<tr>
<td>Level of object ownership</td>
<td>-1 = private or no objects</td>
<td>0 = limited sharing</td>
<td>1= public</td>
</tr>
<tr>
<td>Level of access</td>
<td>-1 = private</td>
<td>0= membership fee</td>
<td>1= public</td>
</tr>
<tr>
<td>User-to-user relationship</td>
<td>-1 = collaborative</td>
<td>0= conditional</td>
<td>1= competitive</td>
</tr>
<tr>
<td>User-to-environment</td>
<td>-1 =</td>
<td>0= conditional</td>
<td>1= competitive</td>
</tr>
</tbody>
</table>
Having developed a taxonomy with which to compare VWs, this study can now proceed to the application of the facets to shed new light into existing VW scholarship.

**Bivariate Comparison of Virtual Worlds**

Although there are broad differences among the VWs classified for this study, there are also interesting patterns of similarities among them. By converting the facets to discreet quantitative values, as shown in table 3-1, their differences and similarities, as well as the gaps in their development, can be identified. Note that due to the use of discrete variables, each visible data point on the graph may represent a stack of many data points.

Empty quadrants in the bivariate charts indicate the combinations of facets that do not currently exist in the realm of VW development. These gaps raise questions about the desirability of those combinations or other factors that might inhibit the development of worlds with those facets. To address these questions, the facets included in the bivariate comparison and each quadrant’s combination of those facets, as well as the VWs that fall into each quadrant and the intercepts between them, were explored to address the following research questions:

<table>
<thead>
<tr>
<th></th>
<th>collaborative</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of groups</strong></td>
<td><strong>that can be joined</strong></td>
<td><strong>-1 = none</strong></td>
<td><strong>0 = one</strong></td>
</tr>
<tr>
<td><strong>Level of identity</strong></td>
<td><strong>formation</strong></td>
<td><strong>-1 = static</strong></td>
<td><strong>0 = conditional</strong></td>
</tr>
<tr>
<td><strong>Level of group</strong></td>
<td><strong>access</strong></td>
<td><strong>-1 = none</strong></td>
<td><strong>0 = permission</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>-1 = multiple</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>1 = custom</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>1 = open</strong></td>
<td></td>
</tr>
</tbody>
</table>
1. For quadrants containing no facets: Why are there no worlds that fall into this quadrant?

2. For quadrants containing many facets: Is there a development opportunity for this combination of facets or is there a valid reason for not combining these facets?

3. How would a world with a particular combination of characteristics appear? Would it be useful for entertainment or educational purposes?

**Level of Stigmergy vs. Level of Object Ownership**

Fig. 3.1 shows the classification of VWs into quadrants according to their levels of stigmergy and object ownership. As previously discussed, level of stigmergy refers to the ability to manipulate an environment in a lasting manner, such as the ability to construct buildings and erect signs within a VWs, and level of object ownership refers to the extent to which users can share objects in their inventory with other users (i.e., whether one object can coexist within more than one inventory or is accessible by more than one user in the environment). Quadrants I and IV illustrate that no VWs have truly open object sharing regardless of level of stigmergy. Quadrant III is indicative of worlds such as *World of Warcraft* in which users are unable to create lasting content and objects are only truly owned by one user. Although *World of Warcraft* offers a shared “guild bank,” a form of “safe deposit box” that multiple users can access, no one object can simultaneously reside within more than one inventory, and once an object leaves the shared guild space it becomes the property of one user. Quadrant IV includes worlds in which users can create content but cannot co-own this content with other users. The
"SIMS Online" would fall into this quadrant, as users in this world can create, sell, and give away the unique objects that they create but cannot co-own any iteration of these objects.

Worlds with limited levels of stigmergy, such as *Ultima Online*, allow users to create specific custom items. For example, *Ultima Online* users may create “runes” in which to write text and then display in public spaces as a form of advertising, as well as

![Stigmergy Vs Object Ownership](image)

Fig. 3-1. Classification of VWs into quadrants by levels of stigmergy and object ownership. Quadrants I and IV illustrate that no VWs have truly open object sharing regardless of stigmergy.
clubhouses in which their guilds can share content and log on and off safely, thus
providing a shared common space in which guild members may strengthen their social
ties (Koivisto).

This comparison indicates the lack of worlds in which objects can be freely and
consistently shared among all users, which may be related to the way in which data are
stored in VWs. That is, because objects are described in databases by their attributes
and location rather than by their ownership data, they are difficult to manage,
regardless of whether they are user created or system created. In addition, worlds that
have gaming mechanics typically have an economy related to objects based on their
usefulness and rarity that requires limiting access, as the objects offered by the
economy would have little value if they were equally accessible to all users. Indeed,
limiting access to these objects is an integral part of game play.

An environment with unlimited stigmergy and true object sharing such that
every user can edit and manipulate every object would be a world that resembles a wiki.
As shown in fig. 3-2, Quadrant I is empty, indicating that there are currently no worlds in
which these two facets coexist. This gap is interesting because it implies that the same
community trust and accountability that allows sites such as Wikipedia to empower a
community to contribute to a common goal (i.e., an amateur-created yet well-
documented encyclopedia) has yet to develop within a VW space. Although there are
open-source worlds, such as Qwak and Croquet, their level of crowd-sourcing ends at
their programming.
The reason for such lack of openness is that the implementation of VWs does not allow for open development. As objects in VWs are much more complex than are text objects that are crowd-edited in a wiki, enabling all users to engage in object creation and editing would require a level of programming and version control more complex than any current VW currently provides. Until object creation is simplified, enabling such openness is impossible.

**Level of Stigmergy vs. Level of Identity Formation**

Quadrant IV illustrates that stigmergic environments will most often extend custom content creation to identity as well as environmental elements. Identity formation in a VW ranges from selecting a character from a predefined set of bodies, as
Fig. 3-2. Classification of VWs into quadrants by levels of stigmergy and identify formation. Quadrant IV illustrates that stigmergic environments will most often extend custom content creation to identity as well as environmental elements.

can users in MTV’s Virtual Lower East Side, to creating fully customized and flexible avatars, as can users in Second Life. There are user benefits and challenges at both ends of this spectrum. At the predefined end of the spectrum, static avatars are more easily understood by other users in a VW. For example, if character classes are assigned to specific avatars (e.g., wizards always wear robes and tall pointed hats), other users can easily recognize and interpret another user’s abilities within a gaming world. However, allowing the use of only predefined avatars limits self-expression. In contrast, users are provided with the maximum level of self-expression at the fully customized end of the spectrum. However, exercising this self-expression requires more effort in avatar creation (e.g., creating user clothing or skin in Second Life requires advanced Photoshop skills) and prevents other users from accurately “reading” other avatars. For example, it is impossible to determine whether users are experienced users who makes their own clothing and skin or inexperienced users who simply purchased well-made objects simply by looking at their avatars in Second Life.

Quadrant I includes worlds in which users can create content as well as customize their avatars. In the case of Second Life, the same tools that allow users to create objects also allow them to customize their avatar, resulting in a whimsical world filled with a wide variety of avatars and spaces, including castles, shopping malls, and
underwater theme parks filled with users dressed as flamboyant humans, giant dragons, and furry animals, such as the avatar in fig. 3-3.

Fig. 0-3. Avatar in Second Life.

Spaces in Quadrant IV allow users to create or manipulate the environment’s content but not their avatars. Worlds such as Qwak provide tools with which to display web pages and other content on the walls in the space but limit users to simple robotic avatars, such as that shown in fig. 3-3. This leads the focus of Qwak to be activities within the space and on the space itself rather than on user-to-user social interaction.
Quadrant IV contains worlds with environments that are largely predefined, such as *Cyworld*, in which users largely exist within predefined spaces and in which user-to-user chat is the primary activity. In worlds that do not allow for conditional identity customization, users’ avatars contribute far less meaning to the space. Conditional identity becomes incredibly important in worlds with competitive environments or competitive user-to-user relationships, as is discussed later in this chapter.

The gap in Quadrant II illustrates that none of the worlds studied allow users to customize their avatar but not to create content in the environment. As with *Second Life*, the tools used to fully customize one’s avatar are often the same tools needed to create other kinds of in-world content. It appears that VW developers do not see value in allowing users to craft user-generated content (UGC) for their avatars if that same content creation cannot be applied to the world itself. Imagine a world such as...
Warhammer Online where there is no stigmergy but with custom avatars added. Rather than watching armies of soldiers and wizards, whose appearance suits the storyline and setting of the world, we might see skateboarding raccoons sliding into battle. If users were allowed to customize their avatar but not change the world to suit it, there would, no doubt, be extensive clashes between the tone of users’ avatars and the carefully crafted environment of the game. Although such a world might allow users to flex their creativity and dress themselves in ways that the world designers never dreamed of, the continuity of the static environment would likely clash with the users’ creations. These clashes would decrease the immersive qualities of the world, which might reduce users’ feeling of involvement in the story arch or distract them from game play.

**Level of Object Ownership vs. Nature of User-to-User Relationship**

The relationships that users can form in VWs range from collaborative relationships, in which they are unable to attack one another, to conditional relationships, in which they may attack or fight one another in certain circumstances, to competitive relationships, in which they may attack one another at any time and in any space. Most gaming worlds allow for the formation of conditional user-to-user relationships in which players from different factions may choose to enter player-vs.-player (PVP) areas and duel one another or engage in large battles. Other VWs, such as IMVU and Second Life, promote the formation of collaborative relationships because the activity in these worlds is much less focused on competition and much more focused on socializing. The results of the bivariate analysis shown in fig. 3.5 indicate a possible...
connection between level of object ownership and level of competition in user-to-user relationships.

Fig. 0-5. Classification of VWs into quadrants by level of object ownership and nature of user-to-user relationship.
Quadrant II includes worlds such as *ExitReality* in which users who meet to view a document on a wall in a virtual room all have the ability to interact with the document (see fig. 3-6). As such, their activities are potentially collaborative rather than combative.

Fig. 0-6. Users in *ExitReality* viewing a webpage displayed on a wall in a virtual lobby (Riley).

Along the lower half of the Y-axis (nature of user-to-user relationship) and in Quadrant III reside worlds in which objects are privately owned or shared only in limited ways and yet the interaction among users is not combative. *Hello Kitty Online*, in which users can ask their friends to assist them in building a home or growing a garden, and *Second Life*, in which users work cooperatively to complete tasks, are included in this group of worlds. The competitive user relationships formed among users in the worlds within Quadrants I and II influence the nature of object ownership. A world in which
users may compete against one another for prized objects or resources cannot encourage full object sharing, which may either provide users within the same faction with an advantage against other players or devalue objects by making them freely available.

**Nature of User-to-User Relationship vs. Nature of User-to-Environment Relationship**

As previously described, VWs may pit users against one another within a competitive environment or encourage social activities via collaborative relationships. VW environments have similar relationships to users. In collaborative environments, users need not be concerned about roaming mobs of monsters or enemy soldiers, whereas the elements of game play are the focus of competitive environments in which users are pitted against non-player characters (NPCs).

Quadrant III in fig. 3-7 contains a wide variety of social worlds, including *Second Life*, *IMVU*, and *Exit Reality*, whereas Quadrant II contains VWs in which users are encouraged to collaborate with one another to create strategies to defeat the enemies produced by the virtual environment. Along the Y-axis reside worlds in which relationships between users are conditional, such as *World of Warcraft*, which contains allied cities in which users are guaranteed safe passage as well as war zones in which players may freely attack one another.

The gap in Quadrant I illustrates that none of the worlds studied can be characterized as entirely competitive in terms of other users and the environment such that its users would have no safe harbor and every entity, whether an NPC or fellow user, would attempt to attack them. The absence of such worlds may be due to the fact
that such a combination of facets would leave no room for teamwork or camaraderie, and would be a very lonely and exhausting space. Quadrant IV contains worlds in which users fight only one another. Such worlds must be either geographically small so that users can find one another or extremely well populated; otherwise, users would spend

Fig. 3-7. Classification of VWs into quadrants by nature of user-to-user relationship and nature of user-to-environment relationship.

the majority of their time tracking one another to engage in battle.. The character class of the bounty hunter in Star Wars Galaxies approaches being characterized as a purely competitive game that allows users to track one another. As shown in fig. 3.8, the bounty hunter’s sole goal is to hunt down Jedis (other players who have achieved this
status through game play) using droids and robots that scour the galaxy and deliver information back to the player about the location of his or her prey. Although playing a bounty hunter is enjoyable, the success of a Jedi player’s mercenary mission often involves hours of searching to find one’s target.

Fig. 0-8. A bounty hunter accompanied by a droideka robot used to locate assassination targets in *Star Wars Galaxies* (Intellagirl).

The constraints of a competitive user-to-user world can be further illustrated by examining *Ultima Online*. When the world first came into existence, all users could fight one another in any region of the environment, as well as kill one another, loot each other’s bodies, and steal items and equipment. Within a short time, looting became so rampant that users began to complain about the chaos and lack of safe havens, and in reaction the developers changed the world’s gaming mechanics (Koivisto 9).
Nature of User-to-User Relationship vs. Number of Groups That Can Be Joined Simultaneously

Joining groups is an integral part of the social structure of a VW, as it allows users in competitive worlds to establish a system of allies. Groups in VWs take forms such as guilds, interest groups, and patron groups for a service producer. In collaborative worlds, such as Second Life and Qwak, users join groups to find users with common interests. For example, both of these worlds contain groups created by members of a specific campus or business, as well as groups created by fans of a particular musical group or artist. In gaming worlds with conditional or competitive user-to-user or user-to-environment relationships, these groups often take the form of guilds. For example, in City of Heroes, players form “supergroups” that may own a base used as a clubhouse. For the purpose of this study, the term group refers to an entity characterized by the lasting and permanent membership of its members unless they are ejected by the leader of the group or leave the group voluntarily. As such, it does not encompass short-term groups users join for a specific purpose, such as collaborating to fight a specific battle.

Quadrant II includes Second Life and other social VWs in which users join multiple groups to express their interests. Second Life currently allows users to join up to 25 groups at a time. These groups have important management functions in the VW. Group owners can use the permissions associated with membership to give users abilities such as land management, access to exclusive content, and management over other members of the group (see fig. 3-10). Owners can also use group mechanics to
send information to all members at once in the form of notices. Group memberships in *Second Life* are displayed in a user’s profile, which may be viewed by anyone, and can be displayed above an avatar’s head along with his or her name. Thus, groups in *Second Life* are a form of self-expression within public forums.

In Quadrant III, worlds such as MTV’s *Virtual Lower East Side* have groups that do have these combinations of world mechanics. Users may express interest in a band, for

![User-to-user Relationship Vs Group Number](image)

**Fig. 0-9.** Classification of VWs into quadrants by nature of user-to-user relationship and number of groups that can be joined simultaneously.
Fig. 0-10. The group management menu in *Second Life* allows group leaders to assign roles and abilities to group members.

example, by including that information on their profile, but there are no official groups to join. The axes in fig. 3-9 demonstrate that most worlds with conditional user-to-user relationships allow users to join only one group. In worlds in which survival relies on having a stable group of allies, groups are important. In *World of Warcraft*, for example, guild members may share resources, assist one another in completing quests, and work together to accomplish larger goals such as performing raids. In fact, guilds are so important in *World of Warcraft* that over 66% of players belong to one ("Body and Mind" 411).
"World of Warcraft" is split into two factions, Horde and Alliance, and all users belong to one side or another based on the type of character they choose when first logging in. Members of the factions in "World of Warcraft" speak different languages. Thus, if a Horde member encounters an Alliance member and attempts to text-chat, the program converts the user’s typed messages into incoherent babble before displaying them. In competitive worlds, groups are often necessary to advance within the game. For example, in "World of Warcraft," some quests are difficult to complete alone, and guild members may offer easy access to help.

Other worlds with conditional user-to-user and user-to-environment relationships have complex ecologies of in-world professions, which encourage individuals to form stable groups to work as co-ops. "Star Wars Galaxies," with its many player professions, is constructed to encourage relationships among users. Most classes in the game rely on members of other classes for ingredients, battle assistance, and healing. Building a guild with a wide variety of professions means that members always have access to the support of other professions when they need it (Ducheneaut, Yee, and Moore 360).

Quadrants I and IV of fig. 3-9 are empty for two reasons. First, there are no worlds in this study that have constant user-to-user competition. As mentioned in the previous section, a world without allies of any sort would be difficult to survive in. Second, if users were in constant competition, they would not be able to, and would have no motivation to, join groups as allies. There are very few VWs in which users in conditional relationships may join more than one group. It is safe to assume that in
worlds where users are trying to defeat each other, allies are important. However, such alliances cannot be fickle if they are to be trusted. Thus, most conditional user-to-user worlds allow players to join and establish their allegiance to only one group. Moreover, these groups are usually closed and only allow members to join by invitation.

![Fig. 0-11. The Lanakila guild from World of Warcraft pose for a portrait (Lanakila).](image)

The social benefits of groups in competitive worlds are often misrepresented in VWs research. Christoper Peters and Alvin Malesky and Joshua Smyth represented increased social ties in VWs as being “maladaptive” or “problematic.” Neither of the researchers’ articles explored the important role of guilds in VWs and how users rely on one another not just for survival, but also for extended social interaction and peer support. Because the research did not explore user-to-environment and user-to-user
relationship facets, the findings from their surveys cannot be compared to those of similar surveys of users in collaborative environments such as Second Life. The findings would be incommensurate because there was no consideration for the complexity of the causal relationship between group numbers and user-to-user relationships.

Users of Second Life, for example, who spend more time with their in-world friends than with their analog friends might have different motivations for doing so than users of World of Warcraft. On the other hand, comparing survey findings regarding social relationships in World of Warcraft and Warhammer Online (two worlds with single-group membership and competitive relationships) could be enlightening if it were found that one had less impact on analog social relationships than the other. In other words, the findings of these surveys would be commensurate because the facets of the two worlds are similar.

**User-to-Environment Relationship vs. Group Number**

As with user-to-user relationships, groups are important to competitive user-to-environment relationships. Competitive environments are worlds in which roving mobs of monsters, enemy soldiers, or other antagonistic NPCs are out to defeat users. In most game worlds, the user-to-environment relationship is conditional, meaning there are NPCs who are competitive and others, such as townspeople and skills trainers, who are collaborative.

In fig. 3-12, Quadrants II and III include social worlds where users may join multiple groups or where groups are not present. Quadrant IV includes game worlds in which users are left to fend for themselves against a competitive environment without
stable groups, though casual alliances may be formed for short-term help. Quadrant I demonstrates the lack of competitive worlds in which users may join multiple groups. As stated in earlier, alliances become critical in competitive environments; thus, groups require dedication to establish trust relationships. The ability to join more than one group would undermine trust and call a user’s dedication to the group into question. Multiple alliances would allow for double agents and political intrigue; however, to date, such a VW does not exist.

Fig. 3-12. Classification of VWs into quadrants by nature of user-to-environment relationship and number of groups that can be joined simultaneously.
User-to-User Relationship vs. Identity Formation

Identity formation is a critical component of most VWs. The user’s ability to create an avatar as a form of self-expression is central to almost all VWs. VWs with static identity do not offer users tools to change their avatar after creating it. Thus, most game worlds use conditional identity formation. Armor and other avatar customizations are earned through the game’s mechanics or purchased from vendors in the game world. Because these customizations are standardized within the game world, they become cues to other players of a user’s status and achievements. fig. 3.13 and fig. 3.14 show the same character in Warhammer Online and illustrate the way conditional avatar customization conveys a user’s achievements. Players can surmise that the avatar in fig. 3.14 is of a higher level than the one in fig. 3.13 simply by examining its customization.
Fig. 3-13. A starting character in *Warhammer Online*.

Fig. 3-14. The same *Warhammer Online* character shown in fig. 3-13, 20 levels later.
Although researchers have found that players of *World of Warcraft* and other MMORPGs often create their avatars to be their ideal selves, these findings must be filtered through the levels of customization allowed in the game world. Katherine Bessiere et al. found that in a survey of *World of Warcraft* players, that the “player’s characters express aspects of the players’ ideal selves with implications for their well-being” (530). The researchers did not, however, discuss the limitations of the character-creation system or the conditional identity formation in *World of Warcraft* and how the limitations of the system influence the ways users feel about their avatars. Instead, Bessiere et al. links self-assessment and self-esteem to avatar identification by hypothesizing that players who are unhappy with themselves will are more likely to create a character that is their “idealized self” (531). Thus, without an understanding of conditional identity, the article’s findings are somewhat flawed, or at least leave out a critical variable that may influence the findings.

Other researchers have hypothesized that limited avatar creation allows world developers to enforce their own stereotypes and biases, such as racism and sexism, through the choices given to users in avatar creation (Pace). For example, the highest level armor available to female avatars in most conditional identity systems is also the most revealing, as seen in fig. 3-13 and fig. 3-14. In order to choose modest avatar clothing, players may have to sacrifice effective avatar abilities. Moreover, in many conditional identity systems, alternative clothing is not even an option because clothing
items are specific to characters’ race and class. Thus, modest clothing can only be worn by a certain kind of avatar.

Worlds with custom identity formation allow users to make changes to their avatars at any time, typically using UGC. Avatars in Second Life, for example, can become anything they would like to be. More complex customization requires either greater content creation skills (e.g., Photoshop skills to make clothing that is more detailed) or more currency to purchase content created by other users. Fig. 3.15 displays the same Second Life avatar with a range of investments in customization. Because currency may be purchased by anyone, and with enough currency, anyone can buy the most complex and high-quality customizations, users of Second Life cannot necessarily determine the level of experience others have in the VW. However, users can decipher others’ avatars for expressions of personality because there are no limitations on avatar appearance. Thus, every avatar in a customized identity world, such as Second Life, is a text of choices and investments that others can interpret.
Fig. 0-15. Customizations of a *Second Life* avatar’s customizations. The cost of each avatar is approximately (left to right) US$.50, $2.00, and $7.50 and implies the level of skill necessary to create it.

Fig. 0-16. Classification of VWs into quadrants by nature of user-to-user relationship and method of identity formation.

Competitive worlds necessitate conditional identities because an avatar’s attributes are tied to its abilities and experience. A world that falls into Quadrant IV would be filled with avatars with no outward cues as to their abilities. Even close inspection of another user’s avatar would not indicate whether he or she possesses the abilities of an equal foe. Likewise, a world in Quadrant I, in which users are competitive but avatars are customized, would not include the avatar cues necessary to gauge
another player’s ability or level. Thus, in competitive relationships, avatars are important rhetorical devices in VWs.

User-to-User Relationship vs. Stigmergy

As with custom identities in competitive VWs, none of the worlds included in this study allowed for stigmergic content if the relationships between users was competitive. Game worlds are carefully crafted to maintain balance between players and fairness in ability acquisition. These worlds often contain highly polished storylines and environments. Thus, allowing users to change the environment could damage the experience for others. Some game worlds, however, allow limited stigmergy. Lord of the Rings Online, for example, allows guilds to own homes in which users can drop items as decorations. These decorations stay in place until guild members remove them. However, this limited stigmergy applies only to objects created in the game; users cannot upload their own content to be placed in their guild hall.

Quadrant II includes Second Life, which gives users almost unlimited permission and tools to create content. Users with a space to build can create any kind of content they’d like, from the Sistine Chapel to space stations. Fig. 3-18 shows one such creation: the Eiffel Tower in Paris.
Fig. 0-17. Classification of VWs into quadrants by nature of user-to-user relationships and stigmergy.

Fig. 0-18. A recreation of the Eiffel Tower in *Second Life.*
Quadrant III includes IMVU, a social world in which users inhabit precreated spaces such as coffee houses and beaches. Worlds in Quadrant III contain no user-created content. In chapter four, these facets will be applied to the rhetoric generated by users to illustrate how the presence of specific facets results in unique communication patterns.
Chapter 4 Using Activity Theory and Genre Ecology Models to Connect Facets with Motivations in Virtual World Education

In this chapter, I use the VW facets discussed in chapter three to analyze the worlds’ mechanics and apply activity theory (AT) and genre ecology models (GEMs). An examination of the tutorials of a game VW and a social VW are used to illustrate the designer-intended activities in these worlds. I use GEMs to examine the interaction between world mechanics and modes of communication, first in tutorials and then in educational applications in VWs. Finally, I combine the activities, genres, and facets of those worlds into a process for selecting a VW to apply in an educational setting.

VWs are microcosms of evolving culture mediated by their own mechanics. Activities within the world are made possible by developer-provided mechanics, which are the foundation for the user’s virtual abilities. These activities evolve as users overlay their own needs and motivations onto the space. However, abilities are always constrained by the basic designer-provided mechanics of the world. Users in a VW are limited by the senses and expressive tools given to them by the system, much as real-world individuals are in some ways limited by their physicality.

Studies of VWs have focused on the result of the evolution of culture (guild organizations, game play, etc.) rather than on the basic user abilities that facilitate the development of more complex structures, as if studying a civilization before understanding the anatomy of the beings who built it. Therefore, in this chapter, I illustrate how the VW facets discussed in chapter three add valuable insight to a study
of VWs. Using AT (Engeström), I begin by analyzing the methods used in VW tutorials to shape and suggest user activities and then demonstrate how concepts from chapter three add to the analysis.

**Activity Theory: An Introduction**

Proposed by socio-cultural psychologists, AT is a theory of cognition. “AT constitutes a novel approach to the study of cognition, one that both foregrounds the culturally embedded nature of our ongoing practical activity and posits that we think and how we think is ultimately a product of what we do” (Koschmann 17). It is a framework to describe the cyclical and reciprocal interactions among subjects (actors/individuals), the objects of the interaction (the purpose or objective of the activity), and the tools used to facilitate the activity (software, concept, etc.) (Koschmann 17). AT suggests that subjects do not merely interact with the world according to a simple cause–effect relationship; rather, the relationships within an activity constitute a complex, layered, continuous process of learning and situational or cultural influences. In its simplest form, AT focuses on the relationship among a single subject, object, and tool and the context in which an activity occurs (Kaptelinin and Nardi 66).
Fig. 0-1. Diagram of the relationships in Activity Theory.

AT stresses that tools alter our activities, which in turn, alter our tools (Nardi, *Context and Consciousness*). For example, I need to write an e-mail, and I have an Internet-connected computer, an e-mail client, and my native language (the tools), which allow me to convey the message I need to send (the object). As I use the tools successfully or unsuccessfully, I gather feedback and alter my actions to improve my use of the tools and to get closer to completing my object. If I try to send the message without first typing in the recipient’s e-mail address, the software will alert me that I am missing a critical part of the message. After entering the address, I can successfully send the e-mail.

AT also suggests that individuals take into account the context of the activity, such as the cultural or environmental factors that influence the relationships in the activity. Writing an e-mail using my iPhone’s small keyboard or an unfamiliar e-mail client would introduce new factors into the performance of the activity. Given the situation and my need to send the message, my ability to use the device and the client improves through effort and trial and error. The activity itself results in learning.
“Activity Theory posits that conscious learning emerges from activity (performance) not as a precursor to it” (Jonassen and Rohrer-Murphy 62).

A critical element of AT is the view that the tool itself is part of a larger cultural system. The tool limits the object by mediating what is possible. Tools may be physical objects (such as a hammer or lever) or mental devices (such as language or philosophy). They are the product of human activity and develop as they are used within a community or culture. Tools are shaped as they accumulate the social context in which they are used (Joyes and Chen). Engeström argued that the study of tools or artifacts is necessary due to the inability to separate them from the understanding of human activities. In this sense, the ability to deconstruct the mechanics (i.e., tools) of a VW is an integral part of understanding how users inhabit the space, the activities they take part in, and the motivations and incentives that drive them. Thus, it is impossible to analyze the activities within a VW without first understanding the tools used in the world. Moving beyond the activity of an individual to a larger scope causes the AT diagram to become much more complex (see fig. 4-2).
Focusing on only the subject, tool, and object is suitable for examining the activity of an individual. However, individuals live in communities, and their activities are always intertwined with the activities, expectations, and influences of others. In 1987, Engeström introduced a more complex model to explain cooperative work and collective activities and to take into account the ways that community and social structures mediate individuals’ activities ("Learning by Expanding"). In this contextualized model, activity occurs in within a community, or collaborative network. The network is a connected set of nodes, which constitute users with communicative abilities granted by the software, and acts as a mediating factor, along with the rules of the community and the division of labor offered by multiple actors. These relationships offer additional context to any activity.

Communities are based on rules, implicit and explicit, and accepted behaviors that influence how a member is expected to behave and perform. These rules indicate

![Activity Theory triangle with added context.](image-url)
the expected methods of achieving a specific outcome and may include everything from gender roles to policies and laws. Within a community, the activity may be split among several subjects (division of labor) who contribute to the outcome. This division suggests a subject’s role in that community and may imply power relationships or hierarchy (Kuuti, Uden, and Valderas). However, once a new tool is introduced into the community, a contradiction arises if that community does not have rules for the use of it (Frederickson 648). Finally, even on a community scale, there is cyclical and continuous change in the system. The subjects in the community use the tools, follow the rules, and play their role in the division of labor, all while changing and being changed by the system through their activities (Mwanza 55). This process of reciprocal transformation is referred to as internalization (Kuutti “Activity Theory as Potential Framework for Human-Computer Interaction Research.” 31).

According to the framework of AT, the tasks we undertake to accomplish our objectives also exist in a cyclical system of growth and change. We construct our activities to achieve our goals, but those constructions are combinations of actions and operations. Operations are simple acts that we perform unconsciously or autonomically, such as holding a pencil or taking a step. If we combine those operations into more complex acts such as writing an essay or dancing, we create actions. Perform an action often enough, and it becomes operationalized (Jonassen and Rohrer-Murphy).
Activity: Goal directed hierarchy of actions

Action: chains of operations requiring a conscious effort

Operation: unconscious performance of a task

Fig. 0-3. Activity, action, and operation are related from Jonassen and Rohrer-Murphy.

AT posits that we only learn about a process by performing it (Jonassen and Rohrer-Murphy 62). This cyclical process of moving from action to operation in pursuit of accomplishing a goal results in learning. Our orientation is the mental plan created to accomplish an action. Orientation recedes as actions become habituated and operationalized. Should an operation fail to produce the expected results, individuals encounter a contradiction, and the operation again unfolds into action. Development occurs within these contradictions (Kuutti “Activity Theory as Potential Framework for Human-Computer Interaction Research.” 34).

Though critics of AT claim that the process makes a learner seem less like a creative problem solver and more like a robot that simply improves its ability to perform a task, Vygotsky and other learning theorists leveraged AT to describe how learning could be an elegant evolving process that is quite contrary to the process-oriented approach that thinkers such as Illich railed against (Lektorsky 66). In the realms of computer-mediated communication (CMC) and human–computer interaction (HCI), AT has been used as a way to understand the approaches and responses of technology.
users. Attempts to answer questions regarding how users adapt to changes in software and hardware, and how we learn to use a new technology, have been approached using AT. However, to date, no one has used AT to specifically examine how new VW users learn to navigate and communicate within those worlds.

Sinem Siyahhan, Sasha Barab, and David Downton used AT to study parents and children completing game tasks in a VW, focusing on the triad of parent, child, and object and not the tool (7). The lack of attention to tools in previous studies, such as this one, may be partly because VWs are new to education, where most AT research takes place. Also, the majority of VW literature centers on game play in antagonistic VWs rather than on how users learn to use the world itself. AT can only be useful as a framework for understanding VWs if there is a well-developed idea of how the worlds function as tools and instigators of activities. The VW facets developed in chapter three provide both a way to factor in tools and a way to understand those tools.

Research Methods and Activity Theory

AT offers conceptual frameworks for exploring methods of activity and the relationships between them. Therefore, it does not lend itself to a single method of research and does not offer “ready-made techniques and procedures” for research. Rather, it provides a structure that must be “concretized according to the specific nature of the object under scrutiny” (Engeström 97). Victor Kaptelinin and Bonnie Nardi suggested that research utilizing AT must follow a structure that is more of a “formative experiment which combines active participation with monitoring of the developmental
changes of the study participants. Ethnographic methods that track the history and development of a practice have also become important in recent work.”

Regardless of the method used to collect data, using AT to form a research question requires the establishment of what constitutes the integral parts of the activity relationship. Without establishing the identity of the subject, the nature of the object, and the possible functions of the tool, informed questions cannot be asked because the character of these components forms a foundation for inquiry. Identifying the functional facets of VWs provides insight into not only their function as tools, but also the motivations of individual subjects, their objects, and the community context of the evolving activities.

**Expectations in a Virtual World**

In this analysis, I focus on the initial user experience in a VW. As with any software, early user experience is critical in shaping the decision to continue using the software, as well as attitudes toward the software as a tool (as in Gartner’s Hype Cycle by Jackie Fenn). An initial experience that meets or exceeds the user’s expectations encourages him or her to continue using the software. An experience that results in frustration or disappointment may result in the user’s abandoning the software. Thus, the user’s initial experience contributes to the overall success of the software and, in this case, VW. The more satisfying the initial experience, the more likely one is to continue logging in.
Although users have preconceived motivations for entering a VW (e.g., the world’s marketing materials, the suggestions of friends and colleagues, etc.), the world itself must provide a satisfying activity for the user if that user is to have a fulfilling experience. In terms of AT, the world not only is the tool with which the subject interacts, but also provides the object that initially engages the user. Most worlds do this through a tutorial, or set of basic activities designed to introduce the user to the interface and tools and engage them in common objects/objectives. These objects/objectives and the means to achieve them not only give the user a satisfying experience, but also provide a path to engage in further activities as intended by the world’s creators and enabled by the world’s tools.

I test this hypothesis by analyzing the tutorials of two worlds, *Second Life* and *World of Warcraft*, by using AT and exploring the benefits of the components factored into the analysis. I chose to analyze *Second Life* and *World of Warcraft* because they have very different user bases. *World of Warcraft*’s stable user base is over 11 million with extremely high user retention, whereas *Second Life* only recently exceeded 1 million, with only 40% of accounts classified as regular users (Ducheneaut). An analysis of the initial user experience in each world using an AT framework with the facets may reveals why *World of Warcraft* has been so successful.

**Subjects, Tools, and Objects in Virtual Worlds**

Although AT allows for an expanded research focus including context, community, and collaborative divisions of labor, the smallest unit of study under AT is a
single subject, tool, and object. In a VW, the line that connects these three factors is fluid—unlike the example given earlier in the chapter about writing an e-mail. In the example, the line that connects the person writing the message, the tools used to create the e-mail, and the completed message as an objective is relatively static. Activity is fluid in VWs in part because VWs are a product of rhetorical activity. As Brummet proposed, when viewed ontologically, “Rhetoric creates all of what there is to know” in a world where “discourse creates realities rather than truths about realities” (4). Without the communicative acts of users, VWs would be ghost towns of code waiting to be inhabited. The activities of the user are what bring a VW to life, bring meaning to the constructs created by designers, and uncover the truths about the reality within the world. Without user activities, a VW is just a potential reality.

Subject

The user is the subject. However, in the case of VWs, the user’s identity often is more complex than it is in the physical world. As discussed in chapter three, identity in a VW can be simple and static or complex and customizable. Users inhabit the identity of the avatar they control in addition to the multiple identities they embody in daily life. The user’s level of connection with an avatar may change over time as they use it and come to identify with it. However, in an early VW experience, such as during a tutorial, the user may see the avatar as merely a tool with which to interface with the world. Thus, I consider the user at the keyboard to be the subject rather than the user plus avatar.
A study of users must take into account technical literacy (i.e., ability to use a computer) and prior experience with VWs. Both factors influence users’ experience of the tools and their objectives in the world. In an effort to analyze initial user experience in an abstract and general way, elements of subject are not taken into consideration. For the purposes of this analysis, I assume that the user is technologically literate enough to have installed the software and to not feel intimidated by entering a VW for the first time.

**Tools**

The VWs are tools, but their complexity requires that they be broken down for analysis. Considering a VW interface as a single tool would oversimplify the analysis and only provide insights regarding the initial appeal of one world over another. Moreover, the results would be insightful only in terms of the VW’s marketing methods and could not contribute to an analysis of user retention. Because the goal of this analysis is to illustrate the benefit of using facets of VWs within an AT framework, and not to create a complete analysis of all available tools in the two worlds compared, I focus only on the tools featured in the tutorial, specifically the end of the tutorial, in which the user is advised on what his or her next object (the first self-selected objective) should be.

**Object**

The object is the key element of this analysis. Accomplishing the object is the key motivation within the activity. Tutorials provide the user with a structured set of objects, such as learning to move, travel, communicate, and make use of other key elements of the interface. Although the user may bring his or her overriding object into
the world (e.g., playing a game with friends, establishing a virtual business, etc.), the
tutorial provides the VW designers with an opportunity to suggest objectives for the
user, which may help to engage users in a satisfying experience within the world. I
hypothesize that worlds that provide a clear path of objects for the user have a higher
retention rate. In this analysis, I use AT to demonstrate that World of Warcraft fills this
need, whereas Second Life does not.

AT stresses that the whole of the relationship among subject, tool, and object
should be the focus of analysis. However, in this case, the subject seems to recede into
the background. All new users in a VW are treated the same by the software. Thus, the
VW is not concerned with an individual user’s motivation for logging in. Rather, the
system of the VW treats all users equally and assumes that the designers’ intended
objectives are the objectives of the user. Much like Janet Emig’s concept of a positivist
governing gaze, the software does not consider the user’s context, motivations, and
prior experience (163). Because of this, the tool and object come to the forefront in the
analysis—so much so that the line between them becomes somewhat blurred in the
discussion of VW tutorials, which are an introduction to the tools and intended objects
within the world.

Tools and objects are tied closely to the rules of the space. These rules are not
merely behavioral suggestions, but also limitations and abilities programmed into the
world, which users do not have the choice to accept or reject. Nardi claimed that
individuals see the limitations set by rules as “resources preserving good design” (My
Life as a Night Elf Priest 74). I argue that, in the early space of the tutorial, rules are the
guiding posts that ensure a user has the experience intended by the designers. Rather than preserving the design for the new user, rules preserve the experience.

It should be noted though, that the distinctions among rules, tools, and objects in a VW is weak. The tools are the source of the rules (i.e., Second Life has a rule that allows users to fly, whereas in World of Warcraft, flight is only allowed using a mount and only for users at high levels). The result of limiting flight to high-level characters in World of Warcraft preserves the hierarchy of players and provides motivation to low-level users to continue playing. Objects arise at the crossroads between rules and tools, such as the goal to reach the level at which World of Warcraft users may purchase a flying mount. “Rules direct and motivate the activity of the actors, not the other way around” (Nardi My Life as a Night Elf Priest 70). Jannis Kallinikos explained that when examining software of any kind, researchers must emphasize tools and rules; focusing on the subject may give a skewed view of the activity (251). “There is something to learn about hammering not from ‘contextual encounters’ involving watching individuals hammer but from addressing the hammer itself” (Nardi My Life as a Night Elf Priest 69). The rules in a VW enable or inhibit activities and are created by the tools and intended objects.

Activity Theory and the World of Warcraft Tutorial

New users of World of Warcraft begin at a starting location based on the race of the avatar they have created. After a dramatic, cinematic opening with sweeping camera angles and flyovers of mythical landscapes, which introduces the backstory of
the avatar’s race, the camera sweeps down to focus on the avatar. The avatar stands in front of an non-player character (NPC) with a question mark over his or her head. A pop-up on screen tells the user to right click on the NPC to interact with it. Although the player is not confined to following the tutorial step by step and may close it at any time, following the suggestions of the tutorial guides a player through the basic features of the interface (e.g., movement, interacting with NPCs, opening one’s inventory, using objects, and finding locations on the map). The tutorial is performed in the context of completing a few initial quests that conform to the common types of quests in the world: finding a specific NPC to interact with, collecting items for an NPC, killing a specific number of monsters, and buying and selling items from a merchant.

Along the way, the avatar levels up (a measure of achievement and method of gaining new abilities in *World of Warcraft*), and the user receives encouraging messages, prompting him or her to find a trainer to gain new spells, attacks, and beneficial items. The tutorial ends when the user has finished all of the tutorial quests and is ready to venture into the rest of the game. It is important to note, however, that the starting areas in *World of Warcraft* are part of the rest of the game’s world and are not separate. Even while completing the tutorial, players can see the avatars of other players doing the same and may interact or team up with them. Thus, even in the first few minutes within the world, users have access to the complete interface and all tools. The last message of the new-player tutorial prompts the player to keep going and to enjoy exploring the world, as well as provides a clue as to where more quests await.
World of Warcraft’s tutorial is not unique. Most game worlds provide such a tutorial to teach new users how to use the world’s game mechanics (e.g., fighting, leveling, etc.) and to introduce them to other useful mechanics (e.g., communication, travel, item management, etc.). Game designers know that users need to be able to play to feel an immediate level of comfort and mastery of the system if users are to continue playing. In terms of AT, a world with competitive user relationships or competitive environment relationships has an imbedded set of immediate objects to engage in (e.g., to stay alive, to play the game, etc.), but these objects are foreign to a new player and must be provided by the designers. Tutorials such as World of Warcraft’s provide objects to the subject right away and introduce the necessary tools to complete the activity. Rather than asking the subject to provide his or her own object, the world provides it and models the kind of objects the subject could strive to complete in the future.

Other facets are also introduced in the tutorial. Because users can own objects, inventory management is described as an important feature. Conditional identity within World of Warcraft is constructed from an avatar’s level, as well as from the gear that he or she wears and uses. Thus, the tutorial includes ways to increase one’s ability and the inventory objects associated with those abilities (e.g., armor, spell ingredients, quest rewards, etc.).

Without an understanding of the facets of World of Warcraft, one would be quite puzzled by the tutorial. For example, interacting with the world for the first time without an understanding of the avatar’s relationship to other users and to the
environment would make fighting seem strange, and the user could easily misinterpret aggressive actions as maliciousness toward the NPCs rather than as goal-driven behavior. Because object ownership is not shared in *World of Warcraft*, (i.e., two users cannot possess the same item in both of their inventories), picking up objects from dead NPCs, known as looting, is an important activity. At lower levels of the game, the rules prohibit users from looting another player’s kill. However, later in the game, during raids and other team-based activities, there is no such limitation; thus, the inability to share an object becomes a reason for establishing rules within a group about who gets a powerful item dropped from a defeated monster. Without an understanding of the object ownership facet of *World of Warcraft*, analysis of the group’s decision-making activities would be impossible.

A comparison of this tutorial to one which does not offer up such objectives reveals interesting insights.

**Activity Theory and the Second Life Tutorial**

The motto of *Second Life’s* creator, Linden Lab, is “Your world. Your imagination.” The motto suggests that the world does not provide objects for users; users create their own motivations. When logging in to *Second Life* for the first time, users are presented with a space with several billboards describing the tools of the interface, including how to walk, fly, and chat. There are also lessons available to introduce inventory management and dressing the avatar.
As a tool, the tutorial is passive. Rather than being part of the interface itself, as in *World of Warcraft*, the tutorial resides in items in the environment, which the user must navigate in order to read. Screen shots of the interface tools are used on the billboards to provide guidance. The tutorial does not suggest any rules, does not mention acceptable community behavior, and does not provide suggestions for improving one’s in-world experience. The only hints at motivations or objects are presented on the last billboard (see fig. 4-4), which gives the user four options of places to go to after the tutorial.

Fig. 4-4. Final billboard in the *Second Life* tutorial space.

The first option, “Update your look,” is related to customized identity construction within *Second Life* and offers users an opportunity to teleport to shopping locations where items such as clothing and hairdos may be purchased. The second option, “Thousands of cool places,” suggests an exploration object and teleports the user to one of several popular locations on the *Second Life* map, without providing a
motivation for activity after arriving. The locations are all user-created due to the stigmergic nature of the Second Life environment. The third option, “Meet new friends now,” teleports the user to a greeting area where new users congregate, though the space offers no shared activities that encourage users to communicate with one another. The second and third options are indicative of the collaborative relationship facets of Second Life (relationship to other users and relationship to the environment). Rather than being invited to teleport to fight monsters or to challenge other players, users are invited to make friends and to explore. The final option is to chat with a Second Life user who has volunteered to be a greeter for new users.

Over the years, Linden Lab has experimented with several orientation formats. From videos to robot greeters, all of the tutorial formats have focused on introducing basic tools and inviting users to “live a second life,” with very little direction as to what that life should be like. Early complaints about Second Life came from players of World of Warcraft and other MMORPGs, who were expecting to play a game. They expected to engage in conditional relationships with the environment and/or other users but instead found a collaborative environment and left disappointed and confused. Reviews of Second Life by users who expected game mechanics typically included criticism of the VW for not having built-in challenges or obstacles to overcome and the notion that the tools should be familiar to gamers (Anderson). The lack of suggested objectives in the Second Life tutorial may leave even nongamers wondering what they should do next.

Linden Lab does not share data about users who choose to cancel their accounts or simply do not log in after entering the tutorial. However, comments left on online
forums indicate that many users who leave within the first few minutes of logging in do so because of technical difficulties with the client (e.g., lack of hardware support) and confusion about the point of Second Life is (*Online Gamers Anonymous*). The latter reason is directly related to the tutorial’s lack of user objects. Without the object, the tool and subject cannot define an activity.

**Genre Ecology Models: The Next Step in Activity Theory**

AT analysis provides insights into the way that individuals, their tools, and their objectives are connected. Through this lens, researchers can learn about the activities that designers provide to new users. However, because tutorials are constructed with prescriptive activities provided by designers, tutorials say little about the activities that make up the remainder of the user experience. Critics of AT claim that, when applied to digitally mediated activities, the theory drives researchers to conduct overly granular analysis and that distilling activity down to simple operations implies a sort of automaton mentality in the subjects (*Kaptelinin 43*). In an effort to see the larger context of these activities, researchers developed another model, Genre Ecology Model (GEM), to examine what happens after the objective is reached. By focusing on the communicative results of activities, GEM explores how patterns of recurrent activities form stable, repeating forms of communication. Creating genre ecologies adds a layer to the tutorial analysis by going beyond intended activities to intended genres.
Origins of GEM

In response to the growing complexity of workplace communication patterns and technological mediation of activities, scholars who study rhetorical practices at work formulate frameworks to explain the ways communication artifacts are tied to the activities and thought processes that are archived and shared through documents. AT describes the way an activity is completed, but it stops there. Yet, activities do not occur in a vacuum. Where one stops, or is completed, another begins. The realm of human actions exists as a web of interconnected motives (K. Burke *Rhetoric of Motives*, 99). These motives and their resulting actions are shared and externalized through rhetorical activities. Documents, speech, and nonverbal interactions are the shareable proof of the activity. When these acts become socially and culturally recognizable and fill an expected function, they become a genre (Yates and Orlikowski, 15).

There are two accepted ways to map these webs of activities: communication event models (CEMs) and GEMs. Both models are largely the work of three scholars: Clay Spinuzzi, William Hart-Davidson, and Mark Zachry. Genre ecology is an “analytical framework for studying how individuals use multiple artifacts—such as documentation, interfaces, and annotation—to mediate their work activities” (Spinuzzi "Modeling Genre Ecologies" 200). In these frameworks, genres are defined as artifact types that symbolize “relatively stable responses to recurrent situations” (Spinuzzi "Modeling Genre Ecologies" 200).
For example, to a university help desk that provides computer user support, a trouble ticket is a type of genre that repeatedly serves an operator’s need to record the user’s issue and technical specifications. A CEM of this system would display the trouble ticket as an entry in a system, such as Bugzilla, created to track tickets. In the CEM framework, the medium through which the genre is created is inseparable from the intended purpose of the genre. Thus, these visualizations of genre networks describe the designed system rather than the actual system (Hart-Davidson 73).

![Diagram]

Fig. 0-5. Simplified communication event model of a help-desk communication process.

As opposed to CEMs, GEMs track the actual use of the genre, rather than the designed use, by allowing for the possibility that users may use alternative tools or methods to achieve the same outcome. For example, in the help-desk example, operators who are familiar with a reported problem and know that a specific technician is the best one to respond may directly call that technician rather than relying on the system to assign the task. The operator may also take down additional details that do not fit into the prescribed fields in the trouble-ticket system.

These alternative tools and methods arise from various motives and result in GEMs that are more complex than a CEM of the same process. Spinuzzi, Hart-Davidson, and Zachry theorized that one source of replacement genres is a worker’s previous
experiences of other workflows. Workers may substitute a method of communication that they are familiar with or find effective “particularly (but not simply) when they are dissatisfied with how work is performed” (44). It would be overly simplistic to reduce the differences between CEM and GEM to disgruntled users or to improvisational

![Genre ecology model of a help-desk communication process that incorporates alternative tools to accomplish a purpose.](image)

genres, however. Instead, GEMs record the evolution of a system as users adapt it and are adapted by it.

Ecologies have three consistent characteristics. First, they are contingent. The connections and nodes describe how an activity is accomplished. The network can change if the provided genres do not effectively accomplish the task. Second, ecologies are decentralized. Any one genre is insufficient to accomplish the task. The network is necessary to depict the work; a single genre would not be enough. Lastly, ecologies
gradually move toward stability even though they are contingent (Spinuzzi "Modeling Genre Ecologies" 202). The post-it note an operator might use to provide information that cannot be entered into a trouble-ticket system could eventually result in the system’s being edited to include that data.

**Unit of Analysis in Genre Ecology Models**

To begin visualizing GEMs, the units of analysis that appear in the model should be identified. Spinuzzi used “ecology” to describe “texts that when used together accomplish more than any one of them could” ("Modeling Genre Ecologies" 200). However, the definition of “text” is critical to understanding genre, one unit of analysis in GEM. There are two units of analysis in GEM: (a) chains of coordinated communication events understood as writing activities or projects, and (b) genres understood as typified responses to recurrent social situations and recognizable as regularities in the formal features of discourse (Miller 151, Spinuzzi et al. "Modeling Knowledge Work"). Thus, “text” refers to a writing activity performed to accomplish a regular communicative task. However, “writing” is not used as a literal term and could be replaced with “composing,” in that a text is anything that results from an external communicative action and may take the form of speech, filling out a form, clicking a button, or a nonverbal physical cue.

Ecologies, therefore, are networks of genres used in coordination to address a given task. Spinuzzi et al. clarified the functional definition of communication as “the transactional, intersubjective exchange of information, thoughts, writing or speech
among participants” ("Chains and Ecologies" 43). To be labeled as a genre, communication must be recognizable by others as a commonly used form of meeting a familiar purpose (Yates and Orlikowski 15). This is a critical distinction because a node in the network that is not recognizable by the users in the network cannot serve its intended purpose. The communication situation must be familiar to the users for the genres to be recognized.

The genre nodes of a GEM are connected through mediating relationships. Each node is affected by the one before and, in turn, changes the one after it. These relationships may be sequential (i.e., nodes that occur in a specific order due to their purpose), modifying (i.e., each node augments or changes the node before), or categorizing (i.e., parent nodes with supporting child nodes which contribute to it; Spinuzzi "Modeling Genre Ecologies" 201). In the help-desk example, the linear steps are sequential. The trouble ticket is not created until a user experiences a problem and calls to report it. The operator’s phone call to the technician is a modifying node because it changes the way the trouble ticket is used to determine the technician who responds to it.

A linear process such as the trouble-ticket system is simple to graph in a GEM. However, systems that are more complex are more difficult to trace. Because of this, it is imperative to have a stable process by which GEMs are created.

**Genre Ecology Modeling Process**

Spinuzzi offered a four-step process to creating a GEM:

1. Identify genres
2. Identify relationships among genres as sequential, modifying, or categorizing
3. Develop the GEM
4. Detect discoordinations ("Developing Genre Ecology Models").

Before the first step is taken, the activity the ecology engages in must be identified. The trouble-ticket system would make no sense without understanding the goal of the process: to provide customer service to end users. Once the purpose of the ecology is known, the genres within it may be analyzed. The “discoordinations” in the fourth step reference “difficulties in interpreting artifacts and managing the actions that those artifacts mediate” (Spinuzzi Tracing Genres Through Organizations 69). If a worker, for example, misunderstands the purpose of an artifact or confuses it for another kind of artifact, he or she will misuse the artifact and cause discoordination. The operator at the service desk may call a specific technician to assign a ticket based on the technician’s perceived ability to solve the problem. However, if the technician confuses the call as replacing the help-desk queue, the normal system for assigning tickets, he or she may stop consulting the queue for assignments and simply wait for phone calls. This misunderstanding of the phone call’s place in the ecology is a discoordination that would result in a conflict or inefficiency in the system.

**Defining Work Within the Genre Ecology Model**

GEMs provide a way to thoroughly analyze activities in VW tutorials. First, it is important to explain how GEMs, developed to explain workplace communication, are applicable to nonwork spaces. GEMs describe the way work is accomplished among information workers. However, the concept of work is not critical to GEMs. Purposeful
knowledge creation and exchange are sufficient to apply the models. Whether activities are performed to obtain a paycheck or to further the concerns of a business is irrelevant to the usefulness of the framework.

Zachry, Hart-Davidson, and Spinuzzi defined three levels of work activity to classify the motivations and intentions, as well as the scope and impact, of the work.

1. **Strategic**: established by managers or leaders to define organizational objectives
2. **Tactical**: established to accomplish specific projects in support of greater goals
3. **Operational**: executed by teams or individuals to build to tactical accomplishments (244).

These three levels are drawn from the ways large organizations stay on track and move forward. However, the levels also easily apply to other organizations and their goals. For example, when they are applied to VW tutorials, strategic activities are the work done by designers, who decide what users should accomplish in the tutorial, while being mindful about how the accomplishments support the overall purpose of the world. Tactical activities are the objectives assigned to users when completing the tutorial. Users learn to navigate, survive, and communicate (operational activities), which aggregate to accomplish the tactical goals provided.
Creating Genre Ecology Models for Virtual World Tutorials

The purpose of the latter part of this chapter is to illustrate the ways that genres and facets of VWs work together to be conducive or nonconducive to educational applications. It is helpful to first see how a GEM is created to perform a familiar or intended activity. To this end, I examine the process of creating a GEM for the *World of Warcraft* tutorial before discussing learning activities constructed in VWs.

Tutorials in VWs are designed to introduce a new user to the common activities, or genres, of the world. They are the product of the strategic work of the world’s creators. Within the tutorial, users are introduced to examples of common tactical goals and the operations necessary to accomplish them. In the *World of Warcraft* tutorial, the strategic goals include introducing the player to the game’s mechanics (i.e., the competitive relationship with the environment and, later, other users; conditional identity construction; and object ownership), which drive the dominant activities in the world.

*World of Warcraft* is an expansive space. Proximity to mobs, NPCs, and other resources is necessary for interaction. Therefore, moving one’s avatar within the world is a foundational operation. The use and placement of one’s avatar is, of course, communicative (see Yee’s work on avatar proxemics for more); therefore, use and placement constitute a genre and are placed at the center of the GEM for the *World of Warcraft* tutorial.
There is only one genre related solely to the use of the avatar and not its position within the world: avatar customization. As discussed in a previous chapter, the conditional identity construction in *World of Warcraft* implies that changing the avatar’s appearance conveys meaning to other users regarding the accomplishments and personality of the avatar. Other genres rely on the position of the avatar (i.e., the movement of the avatar within the world), including the use of the avatar’s ability and its interaction with NPCs. For example, for a hunter to fire his or her crossbow in *World of Warcraft*, the avatar must be placed within a certain distance from a monster. The same is true of interacting with an NPC such as a merchant or quest giver. Most avatar abilities have a communicative action associated with them. When using the crossbow ability, the hunter visibly produces a weapon and fires it at the designated target. The location of the avatar determines which mobs the avatar can fire at. Thus, the relationship between proxemics and ability usage is a modifying one.

The same is true of the relationship between using an ability and interacting with an NPC. However, the relationship between the avatar as a genre and interaction with a quest giver or merchant is sequential. One must first move the avatar near enough to access the NPC, right click on the NPC, and then dialogue with him or her. Verbal interaction with other users is less reliant on proxemics because the limitations on location are much looser. Yet, the relationship is still a modifying one because an avatar is required to engage in verbal activity, and the global placement of the avatar determines the channels available to the user for verbal communication.
Fig. 0-7. Genre ecology model of the *World of Warcraft* tutorial.
Other genres may be employed during the tutorial, such as voice chat and trading among players, but these activities are not introduced in the tutorial and would only be used by players who are already acquainted with them as genres through previous play. The tutorial is designed to be a safe and structured introduction to the genres and activities in *World of Warcraft*, so discoordinations are avoided by means of the design. It is possible to have discoordinations within the tutorial, such as a player mistaking a mob for a quest-giving NPC, which would result in the player’s avatar being killed by the mob—but this would be rare.

All genres that are key to designer-provided activities, such as those in the tutorial, are made possible by the mechanics of the world which are, in essence, results of the world’s facets. Avatar customization is tied to conditional identity construction in *World of Warcraft*; interactions with quest NPCs and merchants rely on the exchange of inventory objects, which relies on private object ownership. Almost all avatar abilities in *World of Warcraft* are combat abilities because the world has a competitive user-to-environment relationship.

**Commensurate Genres and Ecologies in User-Defined Activities**

Tutorials provide an overview of the designer-defined activities within a VW. The world is, after all, designed to allow users to accomplish these activities. However, a hallmark of the development of the culture of a VW is the growth of user-defined activities, either to augment or circumvent the designer-provided goals or to satisfy...
other interests using the VW. If these activities are to take place, they must be supported by the genres within the world.

Corpse spamming, or spelling out words with bodies in World of Warcraft cities, is an example of a non-designer-defined activity that is nevertheless supported by the world’s genres. Because World of Warcraft has limited stigmergy and allows bodies to lie on the ground for a short time, users can take advantage of this and create short-lived billboards on city streets. Corpse spamming was novel years ago when it was seen as a witty and innovative application of the world’s mechanics. However, as years passed, it became common for these billboards to advertise the URLs of gold-farming sites and other disreputable companies. Thus, users no longer appreciate the practice as it represents a user-defined activity that no longer supports a user’s desire to engage in the designer-defined activities; therefore, it is seen as annoying or negative.

The same is true of so-called “noob killers” (high-level players from one World of Warcraft faction who linger in the starting areas of the opposite faction to kill new players for entertainment). Noob killers interfere with other players’ ability to accomplish the designer-defined activities and, therefore, are seen as bullies rather than humorous. The same activity between players of similar levels is seen as sporting and part of the player-vs-player (PVP activity in the game.

In this section, I present examples of user-designed activities to illustrate a hypothesis about why some succeed and some fail. I then use them to evaluate a specific kind of user-designed activity, educational applications within VWs. To be successful (i.e., useful, entertaining, and not disruptive or pointless), user-designed
activities cannot conflict with or be overshadowed by designer-provided activities. User-designed activities fall into four categories. Table 4-1 shows each of the four categories and provides users’ perceptions and examples. For simplicity, I focus on World of Warcraft and not a range of VWs.

Table 4-1 User-Created Activities Defined by Relationship to Designer-Provided Goals

<table>
<thead>
<tr>
<th>Label</th>
<th>Role of user-created activity</th>
<th>General user perception of activity</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict</td>
<td>Conflicts with designer-provided activity</td>
<td>Negative</td>
<td>Gold farming</td>
</tr>
<tr>
<td>Overshadow</td>
<td>Is overshadowed by designer-provided activity</td>
<td>Easily ignored</td>
<td>Chatting on public channels about topics unrelated to designer-provided activities</td>
</tr>
<tr>
<td>Complimentary</td>
<td>Compliments or assists designer-provided activity</td>
<td>Useful, positive</td>
<td>Quest tracking and map add-ons</td>
</tr>
<tr>
<td>Additional</td>
<td>Neither conflicts with nor compliments designer-provided activity</td>
<td>Engaging if justified or entertaining</td>
<td>Social gatherings such as parties or funerals</td>
</tr>
</tbody>
</table>

I hypothesize that educational applications within VWs succeed when they fall into the categories of complimentary and additional. Educational experiences that fall into the conflict and overshadow categories will fail to achieve their learning goals. To illustrate this point, the following pages present a collection of accounts of educational
experiences executed within a selection of VWs, including the outcomes reported for each.

Incommensurate activities are not limited to conflicts between user-created activities and designer-provided activities. The consideration of educational experiences requires consideration of the relationship between the activities provided by the instructor and the students' perception of the activities within the context of the course. The VW's designer-provided goals are a layer placed on top of the course. Table 4-2 shows Table 4-2 Strategic, Tactical, and Operational Goals and Activities across VWs, Courses, and Students

<table>
<thead>
<tr>
<th></th>
<th>Virtual World</th>
<th>Course/Instructor</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic</strong></td>
<td>“Success” and enjoyment • High engagement and prolonged use</td>
<td>Learning objectives • Disciplinary discourse • Career preparation</td>
<td>Course completion • Satisfactory grade • Better or higher paying job • Return on investment of time and effort • Enjoyment</td>
</tr>
<tr>
<td><strong>Tactical</strong></td>
<td>Socialization • Exploration • Creation • Quests</td>
<td>Assignments • Assessments</td>
<td>Efficient completion of course tactical goals • Understanding course mechanics (rubrics, grading etc) • Connecting course objectives and assignments to long-term personal goals</td>
</tr>
<tr>
<td><strong>Operational</strong></td>
<td>Learning to use genres and mechanics to achieve tactics</td>
<td>Information • Experiences • Rubrics • Skills</td>
<td>Attendance • Note taking • Learning facts • Allotting adequate time for completion • Understanding assignment requirements</td>
</tr>
</tbody>
</table>

Zachry's terminology for the motivations and expected outcomes of activities (strategic, tactical, and operational).
Coordination in each column and row are necessary for a successful educational experience. Instructors are familiar with the issues resulting from discoordinations, seen in the right column of Table 4-2. For example, if students do not feel that the material in the course is relevant to their career or that a particular assignment does not contribute to the learning objectives of the course, they may feel dissatisfied with the class. If an assignment contributes only slightly toward the overall learning objectives of a course but requires a long time to complete, students may feel that the assignment is not worth doing.

VWs add a third layer with its own dominant activities introduces further potential discoordinations. Learning to use the mechanics of a complex VW such as *Second Life* to accomplish a course task worth only a few grade points represents an operational discoordination between the student and the VW. An inability to observe students engaging in an activity in order to assess them illustrates a tactical conflict between VW and course. This framework can be used to assist in the identification of factors that contribute to the success or failure of VW instructional design.

In the remainder of this chapter, I use Zachry’s framework to analyze VW education case studies to illustrate why they either succeeded or failed in accomplishing their learning objectives. Coordinations and conflicts among the strategic, tactical, and operational activities in the course are identified and discussed. Unfortunately, the majority of articles concerning VW education refer to either *World of Warcraft* or *Second Life* with little representation of other social or game worlds. However, because the two worlds share only two facets (dominant content form and dominant user-to-
user communication), they provide a wide enough range of activities to explore the theory. Here, I illustrate how the facets serve to complete this framework, which can assist instructors in choosing the right VW for instruction and in ensuring alignment among activities, genres, and mechanics.

**Coordinating Motivations and Expected Activity Outcomes**

As with any emergent or experimental tools, efforts to utilize VWs within educational contexts have a wide range of results. Innovative and successful uses of VWs such as *World of Warcraft* and *Second Life* have been published in disciplinary journals and instruction-technology publications. Even practitioners whose efforts have yielded less than ideal results have been generous enough to share the outcomes of their courses in publications.

To illustrate the relationship among the strategic, tactical, and operational activities in a VW, a course, and students’ participation in a course, I present a selection of case studies of educational applications. I demonstrate that to be successful in accomplishing learning goals, activities should be complimentary or additional rather than conflicting or overshadowing. Ultimately, this analysis contributes to an understanding of VW choice for education. Table 4-3 provides the summaries and outcomes of the studies, along with the genres, used to accomplish the activities.

The bulk of discoordinations occur due to conflicts between the VW and student activities. Within worlds where designer-provided activities are dominant (often, game worlds where user-to-environment and user-to-user relationships are conditional or
competitive), there is a danger of creating course activities that easily conflict with the provided activities of the world. While the genres of the world may support an activity, such as using guild chat as a class discussion space, the activities of the world may prove too distracting or too contrasting to the class activity, as illustrated by Landon Piri,us and Gill Creel.

However, the inverse also seems to be true. Activities created in VWs that complement the designer-provided objectives may benefit from the engrossing nature of activities such as quests and exploration. In applications such as Todd Bryant’s and John Waters’s, it is clear that designing learning activities that coordinate with designer-provided activities creates a compelling learning experience. In worlds where
Table 4-3 Analysis of VW education case studies for activity coordination.

<table>
<thead>
<tr>
<th>Study</th>
<th>Virtual world</th>
<th>Activity summary and genre identification</th>
<th>Activity coordinations</th>
<th>Activity dis coordinations</th>
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<tbody>
<tr>
<td>Shultz Colby and Colby (2008)</td>
<td><em>World of Warcraft</em></td>
<td><em>World of Warcraft</em> was used as a tool for emergent pedagogy in a freshman composition course, as a topic for writing, a space for ethnographic and other qualitative research, and an authentic reader community for student work. Students played the game and wrote rhetorically effective documents for the <em>World of Warcraft</em> community, including help documents, blog posts, and contributions to discussion boards. <strong>Genres</strong>: Designer-provided genres were used to support game play. Students created content in external spaces that provided genres such as discussion posts and blog entries.</td>
<td>None</td>
<td>Virtual world tactical/student tactical (overshadow): The authors stated that if students are not clear about the course objectives, they might not understand that creating the rhetorically effective document is the goal of the assignment rather than the play itself (p. 309). Virtual world strategic/course, student strategic (conflict): Students and faculty expressed doubts that playing a game was worthwhile for the learning goals of the course (p. 310).</td>
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<td>Waters (2007)</td>
<td><em>World of Warcraft</em></td>
<td>University students learning to be <em>Second Life</em> teachers collaborated with a Chinese middle school to provide English tutoring through <em>World of Warcraft</em> using in-game chat as well as VOIP. Chinese students played alongside university students while speaking and writing in English.</td>
<td>Virtual world strategic/course and student strategic (complimentary): Students in the course reported that they felt that tutoring in the game context made the experience more meaningful than other</td>
<td>None</td>
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University tutors practiced language tutoring skills learned in their courses. 

**Genres:** Designer-provided genres were used to support game play. Students also engaged in VOIP chat as a genre through external software.

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**Pirius and Creel (2010)**  

*World of Warcraft*

The instructor of an online community college special topics course about subjective culture, gender differences, and the connections between language and culture chose the community and culture of *World of Warcraft* for study within the course (p. 2). Students participated in various activities such as observing public chat, game play and reflection, formation and structuring of a class guild, and observation of culture within the game, discussion forums, blogs, and other online spaces. 

**Genres:** Designer-provided genres were used to support game play and methods (p. 2).

---

**Virtual world tactical/student tactical (complimentary):** The Chinese students enjoyed the tutoring because it allowed them to play the game and occurred in the context of accomplishing game goals such as quests and item trading (p. 2).

---

**Virtual world tactics/student tactics (complimentary):** The students reported that they saw clear connections between game play and major concepts in the course. 

**Virtual world tactics/student tactics (complimentary):** Participation in the culture required students to learn specialized terminology. They reported finding this an interesting addition to their task of understanding how language forms culture (p. 3).

---

**Course tactical/virtual world and student tactical (overshadow):** As much as the instructors hoped that a virtual world would create community among the students, the results demonstrated that the students spent little time together in-world and instead spent time completing assignments on their own or leveling their characters alone (p. 5).
<table>
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<th>Community interaction. Students repurposed these genres to accomplish goals such as interviews and observations.</th>
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<td>Bryant (2007)</td>
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<tr>
<td>O’Connor (2010)</td>
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<td>Mahon, Bryant, Brown, and Kim (2010)</td>
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</table>
students simulated by colleagues and programmed bots. **Genres:** *Second Life* scripting and building tools, avatar customization.

| | conducted made it difficult for students to fully engage in the simulation. **Course tactical/student tactical (overshadow):** Teachers playing the role of disruptive students disregarded instructions and began using their avatars in unintended ways within the simulation because they enjoyed playing the roles. |
there is no set of dominant designer-provided activities, such as social VWs like Second Life, there is little danger that the world’s activities will crowd out the educational applications.

Nevertheless, discoordinations are possible. Conflict can arise between student objectives and course objectives, rather than between the course and the VW. If the instructor does not make a solid connection between the course’s tactical and operation goals and the students’ tactical and operational goals, then students will disengage or misunderstand the purpose of the activities. (Wood’s findings are an example of this phenomenon.) On the other hand, worlds such as Second Life that lack dominant goals also offer easily manipulated genres that may be leveraged to design creative learning activities—but only if students see the purpose and are not overwhelmed by the world’s operational learning curve.

**Using Activity and Genre to Choose Virtual Worlds for Educational Applications**

Given the difficulty of designing an effective course, even without the complications of using a VW, the choice of whether to use a VW as a course tool is a difficult one. Critical examination of the course and student objectives (strategic, tactical, and operational) can assure that the basic course design is sound. Checking for alignment, both vertical and horizontal, ensures that the learning objectives and associated exercises fit together.

Adding a VW to a course can complicate learning. However, instructors can prevent discoordinations between the course and the VW’s activities by using table 4-3.
Even if the VW is new to the students, the instructor can identify the tactical and operational activities without the students’ having to use the world for an extensive time. The operational activities are largely the result of identifying the facets of the world and using the designer-provided genres. For example, understanding that object ownership is private in *World of Warcraft* means that there must be mechanics to manage objects, as well as an economy related to gaining objects. These genres include personal inventory, auctions, vendor NPCs who buy and sell objects, and a market based on the rarity of objects.

The tactical activities provide the reasons for using the genres. The genres related to the object ownership facet of *World of Warcraft* are the product of tactical activities related gaining, using, or selling objects. These activities are questing, crafting, equipping items on one’s avatar, or participating in the auction system to earn money in exchange for items that other players find useful. In a successful VW, the operational, tactical, and strategic activities are well aligned. Vertical discoordinations could result in a less-than-satisfying in-world experience. If object ownership in *World of Warcraft* were shared rather than private, then the tactical activities around gaining objects would make no sense.

After identifying a VW in table 4-3, instructors should look at the activity coordinations column to discover if the genres support the operational activities of the course or may be manipulated to create new genres, as well as if the VW’s tactical activities will accommodate the course activities without overshadowing or conflicting with them. If there are too many discoordinations, the instructor is faced with three
choices. First, if the operational activities (genres) do not coordinate well, but the
tactical activities do, then the instructor should consider using outside tools to provide
the necessary genres. An example of this is Rebekah Shultz Colby and Richard Colby’s
use of blogs and discussion boards to provide students with opportunities for extended
rhetorical exercises: The chat function within World of Warcraft did not support the
creation of help documents to complement the tactical activities, but a blog did. Second,
the instructor should examine a VW with different facets to look for a better fit. If the
course activities require specialized spaces and the VW is not stigmergic, then the
instructor should choose one that is and examine if it would allow the creation of the
spaces necessary for the course. Lastly, it would be wise for the instructor to consider
that a VW is not a proper tool to augment the course.

Examining the facets of VWs facilitates in-depth understanding of the activities
within a VW. The mechanics of a VW are intrinsically tied to the activities and
motivations of users within the world. Without understanding the opportunities and
limitations given by the rules and tools of a VW, the ability to make observations is
limited. Through an understanding of the activities, genres, and facets of a given VW,
instructors and researchers may begin to understand how designer-provided activities
fit with the user-created activities necessary for an educational use of VWs.
Chapter 5: Implications, Limitations and Further Study

As with any study, the results can create more questions than answers. This chapter offers a discussion of the study’s findings, limitations, and opportunities for further study.

Virtual Worlds

The purpose of this study was to explore the connections between the communication mechanics of social technologies and their ability to facilitate effective learning experiences. The technology, for the sake of this study, was operationalized as VWs.

Findings

VWs as a technology have never been studied in this way. Previous studies focused only on one or two worlds at a time and typically for a specific purpose. This study provides a view of VWs on a larger mechanical scale. The greatest benefit of this scale of study is the ability to differentiate between seemingly similar worlds. From the outside, worlds such as SL and ActiveWorlds look very similar but they are mechanically diverse once their facets are identified. These differences are critically important to research, education, and other applications. This study provides the first method with which to understand these critical differences.

The result of the faceted classification supports the case that VWs represent a convergence of communication tools found separately elsewhere. Because they include these other communication tools, they may be the ideal operational tool for studies into
CMC and educational technology approaches. VWs offer an opportunity to examine each kind of tool without having to create wholly new experiments for each.

VWs have such dominant designer-provided activities that they may be the most challenging tools in which to design education applications. And yet, those dominant activities also mean that they are highly engaging which may mean that they are powerful learning tools. The insights from this study begin to offer guidance in the creation of effective experiences that do not compete with these activities and instead compliment them.

**Limitations**

The operationalization of VWs is both too narrow and too broad. In one sense, VWs are such a huge group of technologies that grouping them together may have eliminated important differentiations that the facets cannot account for. It is possible that a study of this kind could benefit from focusing only on game worlds (those with competitive or conditional user-to-user and user-to-environment relationships) or only on social worlds (those with collaborative user-to-user and user-to-environment relationships). Each of these groups alone is large enough to warrant thorough study for both CMC and educational applications.

As with the study of most technologies, work in VWs must accommodate their constant rate of development. VWs change constantly. It is like studying a river which is constantly in flux. Because of this rapid rate of change the classification of a world is only as accurate as its latest software update. Mechanics can change not only via the world’s developers but also via add-ons created by users where possible.
Accommodating these changes within the study is difficult but worthwhile. Without a willingness to consider these fluctuations studying technologies would be impossible.

In addition to the rapid development and frequent launches of new worlds open source VWs, such as OpenSim and Minecraft, have converted what would have been user-created genres and activities, into designer-provided as a result of the user’s ability to change the mechanics/facets of their own world instance. World with application program interfaces (APIs) cause similar challenges. Conversely, these worlds also provide opportunities to develop custom tools for research and education. From survey tools to Learning Management System plug-ins, worlds with APIs offer custom opportunities.

Ultimately, the greatest limitation to the use and study of VWs is that they are commercial products whose owners have their own motivations. The content we create in most of these spaces do not legally belong to us. We cannot rely on the makers of these worlds to keep things the same. A single update can make our most well-informed experience moot.

**Further Studies**

The ability to classify the mechanics of VWs opens many opportunities for new research not only for educational applications but in the study of the VWs themselves. First, let us consider the education research opportunities.

The research presented in this study argues that creating activities within a VW that complement the dominant activities within that world will be most effective. This was tested against existing reports of activities in VWs but this study did not include the
experimental design of an activity that meets these criteria. Further research should include testing learning designs to compare outcomes from exercises that do and do not conform to the activity alignment.

To keep this study relevant and the method utilized useful, the classification must be a living process. The create a collaborative method to classify emerging tools such as a wiki would allow other researchers add new worlds to list and to correct facets on existing worlds if they change.

Beyond education applications, VWs are being used by marketers, corporate trainers, and others. The method outlined in this study may be useful to researchers in these areas as well. Marketers, for example, could understand how their messages would be best received within a world without being intrusive. Utilizing AT and GEM should help these parties anticipate how their uses of VWs will be perceived by existing users as well as any users they bring in for their purposes.

For those who design VWs, the findings of this study could help explain why users of one game world may be attracted or put off by another world. It should also assist designers of social worlds in understanding how to attract users of game worlds to try social worlds as well.

**Educational Technology**

While this study focuses on the application of VWs there are implications for technologies of all kinds for integration in educational settings from k-12 to corporate learning.
Findings

I would like to split the implications here between the classification and application of technologies.

Classification

The research here demonstrates why methods such as Bloom’s Technological Taxonomy are insufficient to classify tools in an accessible way. There is no standard among educational technology or instructional technology professionals to classify emerging tools. Bloom’s system may help us understand the kinds of cognitive processes present in a tool but it does not directly assist educators and designers in their choice of tool or a method to design effective experiences within those tools. The findings here provide one such method but there may be others. Fundamentally, I hope that the research in this work instigates thinking about the need for classifying tools as well as other ways to do so.

Application

Choosing a tool is only the beginning of a complex process of integrating technologies into learning situations. The process begins with defining learning needs and assessing whether a technology would be beneficial. The method outlined here, when applied to tools other than VWs, could then be used to select a tool and design a learning experience. Understanding how the tool is otherwise used in elective situations is necessary to unpack the activities and genres that are commonly used to best create new experiences that complement the existing culture of the tool.
Limitations

The first, and most important limitation of this element of the study, is to remember that not every learning experience will benefit from technology. Pedagogy must come first. New technologies are tantalizing because they are often associated with excitement and novelty which, it seems, may improve the learning experience of disenfranchised or disinterested learners. It is important to remember, however, that an enthusiastic instructor and relevant challenging content can address most learning issues. Unnecessary integration of technology, with even the best design, may often be unneeded and become simply “bells and whistles.” Research such as this must be tempered with thoughtful decisions.

It is also important to consider that no system is perfect. There is no magic technological bullet that will resolve the issues with today’s education system. Because technology may improve a single learning experience does not mean that there are not more pressing issues in education that need to be addressed. Access to technology is not universal nor is access to quality education. While I believe the research in this study is important it is secondary to these more pressing issues. Technology is not a panacea for larger issues. Research such as this, which makes the integration and application of technology easier in education, should not be misused by those who seek to drastically lower education budgets, reduce teachers, or reduce brick and mortar educational expenses. Though technology may be used in some situations to improve outcomes, it is not, and never will be, a replacement for caring professionals and a stable system that accommodates all.
Further Studies

VWs are not the most dominant tech used in education. There are other tools already in broad institutional use which have never been examined in this way. Tools such as BlackBoard, Angel, and Desire2Learn, which are used every day by millions of students, have never been scrutinized in this way. Instead, large scale learning institutions rely on the commercial producers of these products to understand the tools which will best facilitate learning. LMSs are similar to VWs in their convergence of tools, and as such, offer researchers easily accessible spaces for important research.

Conceptual Implications

This study includes several conceptual frameworks employed in conjunction to create a method with which to view, classify, and employ technologies. Each of these will be considered here.

Epistemic Rhetoric

This research began with an argument that reality, specifically within the confines of a VW, is created by language. This ontological view of rhetoric is a founding assumption for this work. Brummett separates epistemic rhetoric into three arenas: methodological, social epistemic, and ontological. This study focused only on the third of these views, a view in which “rhetoric creates all of what there is to know” in a world where “discourse creates realities rather than truths about realities” (4). This ontological view allows us to conceive of VWs as a space not only of meaning making but also of reality making.
Findings

Technology allows individuals to more easily create realities, whether in a VW or another communication space. Therefore, rhetorical studies, specifically those that come from an ontological epistemic position, are uniquely prepared to not only analyze new reality-creating rhetoric, but contribute to theory that informs and shapes how those tools develop and their socio-cultural impact.

Limitations

Brummett admits that the ontological view of epistemic rhetoric is the most extreme of the three views he outlines. While this view does not go so far as to claim that there is no physical reality, it does propose that humans have no way to know what is real without rhetoric as an interpretive and communicative system to make meaning of the physical world. The ontological view claims that rhetoric is as generative as science. Though my belief as a scholar is that this view of rhetoric accurately accounts for its function in human efforts at meaning making, others who disagree with this will find a fundamental flaw in my argument that VWs represent a new reality and that other technologies may as well. Once that element of the argument is removed, debating that prior research could be improved by seeing VWs as a reality and thus need their own truths outlined, is moot. VWs and the behaviors of the users within them could simply be viewed as rhetorical acts no different than any other outside the tools.
Further Studies

Taking an ontological epistemic view for this work means that Brummett’s other two views have been ignored. However, both of these views (methodological and social) could benefit the study of educational technologies considerably. The methodological view would allow us to examine VWs, for example, as a way for users to recreate or interpret external reality. These interpretations may yield valuable insights. The social epistemic framework would allow rhetoricians to analyze the interactions of VW users, and users of other technologies, in a way which rhetoric has not done before.

Activity Theory

AT offers an excellent framework to understand the relationship between actors, their goals, and the tools used to accomplish those goals. Previous work in AT has focused on the evolution of tools. This work, however, uses AT to explore possible objects intrinsic to a tool and the external objects that educators bring to the tool.

Findings

The results of this study may help to increase the understanding of the relationship between learners and the tool that they are using to learn as well as the community/context of the learning activity. This work also contributes to an understanding of the complexities involved in the assumptions of default tool uses that learners and designers may bring with them.

Limitations

In order to apply AT to a learning situation which includes a complex social tool, one must understand a tool well enough to know what the existing dominant activities
are and whether learners approach the situation with preconceptions of how a tool is used. This requires that instructors, designers, and researchers acquaint themselves, not just with the mechanics of a tool, but also with the existing culture of a tool and the level of awareness with which learners approach the tool. In addition, one must at least attempt to understand what the student’s goals, conceptions, and misconceptions will be in order to avoid them.

**Further Studies**

This research focuses more on the relationships between activities and tools than on the larger context which Engeström adds as rules, community, and division of labor. Further studies in this area may wish to examine how activities are coordinated among larger groups of VW users and/or learners. These areas are especially interesting because, as new realities, VWs also have emerging internal cultures and social mores which undoubtedly influence user goals and activities.

**Genre Ecology Model**

GEM was found to be particularly useful in this research as a method to untangle computer-mediated communication situations in which several tools are used to accomplish a single activity. As a way to breakdown more complex communication tasks, GEM is helpful in describing each step within an activity as a way to isolate the mechanic that makes that step possible within the tool being used.

**Findings**

Though GEM has been used primarily to examine workplace communication, this research illustrates its use in explaining others kinds of communication ecosystems. In
addition, this research also makes explicit the connection between the facets of a tool and the genres possible within the tool whether those genres are designer-provided or user-designed.

**Limitations**

Some scholars may find GEM analysis too deeply founded in rhetoric as a discipline. However, Spunizzi et al have made considerable advances in the development of tools that should be useful to other fields and streamline the creation of GEMs for research. It should also be noted that there are many other methods of discourse analysis that could be employed in similar research.

**Further Studies**

Analyzing learning experiences as GEMs is a new application of Spinuzzi’s method. Educational psychologists and instructional designers may want to explore GEM as a way to deconstruct exercises to discover unexpected aspects of a design such as ensuring various learning modes are addressed, understanding how each step in a learning experience builds on previous steps, or to explore different methods that learners may employ to solve the same problem.

**Other Implications and Further Study**

VWs are but one of many emerging forms of social tools that are gaining ground on campus and in the classroom. Classifying other groups of technologies such as social networks and augmented reality applications is a clear next step in this research. Faceted classification, ACT, and GEM, as combined in this study, can assist us in
understanding these technologies, their impact on our lives, and how to develop new tools which will fill communication needs that are as yet unaddressed.

**Conclusion**

This research is just the beginning, an effort to place a foundation under a quickly moving field. Educators will continue to strive to implement technologies to aid in learning. Researchers will continue to understand how these tools change the way we live, learn, and work. Rhetoricians should always be at the forefront. After all, to be human is to share and communicate.
# Appendix

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<th>Facet</th>
<th>World of Warcraft</th>
<th>Second Life</th>
<th>Mabinogi</th>
<th>Active Worlds</th>
<th>Kaneva</th>
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**Definition traits**

- **WAN**
- **Multi-user**
- **Persistent**
- **Avatar**

**Dominant content form**

- **Text**
- **Image**

**Dominant User-to-user communication form**

- **Text**
- **Visual**
- **Voice**

**Stigmergy**

- **Stigmergic**
- **Nonstigmergic**
- **Limited stigmergy**

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The Manor. Mad Wolf Software. Software.


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Software.


