Creating a Level Playing Field: Improvisational Play and Collaboration in Education

Tina Blaine and Brenda Bakker Harger
Carnegie Mellon University

Entertainment Technology Center
700 Technology Drive, Pittsburgh, PA 15230 USA

bean@cs.cmu.edu, bharger@andrew.cmu.edu

ABSTRACT

Improvisational play methods encourage collaboration, communication and connection amongst groups. Learning can also be enhanced by the basic elements of improvisation; spontaneity, flexibility, and a willingness to experiment and take risks. Soliciting input from a diverse range of perspectives and building an environment based on trust also stimulates the efficacy and creativity of the group process. Consequently, improvisational techniques provide valuable insight for teams prototyping with new media and are particularly applicable to innovation in the field of entertainment. We consider this paper a prelude to further discussion about improvisation and the ways it can be used to explore a variety of educational and entertainment applications from a musical and theatrical perspective.

Keywords
Entertainment, collaboration, communication, improvisational techniques.

1. INTRODUCTION

"Yes & is the most important rule in improvisation" (Halpern) [1]

The authors both teach in a two-year interdisciplinary master's program at Carnegie Mellon University called the Entertainment Technology Center (ETC). The ETC program provides a number of opportunities for students from arts and technology backgrounds to work together to author new media and develop prototypes designed to entertain, educate and inspire their audience. We believe improvisation is the key to successful interdisciplinary projects as it contains all the elements of social interaction and community engagement that encourage meaningful work. Improvisational techniques can be used to stimulate collaboration and lead to more productive teamwork.

The creative process is dependent upon the formation of open-minded environments that allow participants to expand their vocabularies and forge new realms of experience. Not everyone is comfortable with this, particularly people without performance backgrounds. Given this discomfort, improvisation provides a method for achieving equal footing between people of disparate backgrounds and experience. Stimulating imagination in a collaborative group setting requires a level of listening rarely achieved in singular work. As Oliveros points out in differentiating between hearing and listening: ""Everyone with healthy ears can hear – listening takes cultivation and evolves through one's lifetime…We listen in order to interpret ourselves and our world and to experience meaning" [2]. In a group improvisation, the best and most sincere work is presented when participants are humbled by their task and aware that they might encounter failure. Only when the knowledge of failure is present does the work become honest and allow creativity to be unleashed. The assessment of failure allows the leveraging of "lessons learned" towards more successful endeavors in the future.

Creating an atmosphere of trust allows people the freedom to take chances and build upon the collective input of other team members with the "yes and…" approach. In this simple exercise, team members take turns describing a fictitious scenario they "see" before them. Each statement begins with "Yes, and…" and is elaborated upon with subsequent statements, each also beginning with "yes, and…". The result is a group creation, based on acceptance of each idea presented by other team members. Adding to these ideas rather than judging or changing them is the objective. No one has complete control over the process, yet everyone has ownership of the final result. In any brainstorming session or collaborative experience, this is a necessary and desired outcome that is critical to the team's success. The "yes" game is a primary example of trust and the importance of an egalitarian approach to effective communication.

2. BACKGROUND

What is improvisation? A simple definition is to create something out of nothing. "In a sense, all art is improvisation. Some improvisations are presented as is, whole and at once; others are "doctored improvisations" that have been revised and restructured over a period of time before the public gets to see them" [3]. The type of improvisation referred to in this paper is that which occurs in real time – that which is about "getting on-stage and performing without any preparation or planning" [4]. Creating without planning or preparation is the foundation of improvisation. In group improvisation situations, each participant must understand and accept an agreed upon structure or set of rules that lay the groundwork for communication. The following rules, often interpreted and restated in a variety of ways, are considered the main tenets of improvisation:

1) Serve the narrative – play in real time. Listen carefully to what is being presented, then add to it. Build upon what is offered and improve upon it, rather than change to a different end.

2) Be fun to play with – be good-natured and give others the benefit of the doubt.

3) Make your partner look good – focus on the person you are working with and ways to make them appear brilliant.

Following these simple rules provides a framework of trust and a pathway for the expression of new ideas.

3. IMPROVISATION AS INTEGRAL PART OF THE CREATIVE PROCESS

"I try to imitate on piano the leaps in space a dancer makes." (Taylor) [5],[6]

The concept of "free improvisation" – playing whatever comes into one's mind and going with it is a form of "free play" in musical improvisation. Saying whatever comes to mind is the improvisational equivalent of brainstorming new ideas. Random gestures, movement and touch based in a freeform approach to choreography are fundamental elements of contact improvisational dance. Relinquishing control allows the recognition and acceptance that the notes played, words uttered or steps danced may never be repeated. The emotional essence of group experience is derived from the process of shared creation and improvisation. In any interactive media form, the process is the experience, not the end result. Improvisational techniques provide a means for people to explore varying levels of spontaneity, creativity, vulnerability, intimacy and risk-taking within the group process.

From another perspective, "…the popular definitions of improvisation that emphasize only its spontaneous, intuitive nature, characterizing it as the 'making of something out of nothing'--are astonishingly incomplete" [7]. In most musical styles including Jazz, the improvisational form is supported by a pre-existing song structure upon which the musician extends or transforms pre-composed musical ideas into in the moment music. The same theory can be applied to the creation of "new media", as designers are most successful when leveraging prototypes to take advantage of skills and techniques that their audience has already acquired.

Likewise, in its theatrical equivalent, an improvising team devises and follows an agreed upon structure that provides the framework for free play. The structure provides a focus as well as a challenge to meet. An extremely simple example would be telling a story one word at a time. The point of this exercise is not about telling a good story, but to see if something coherent can emerge despite the total lack of control by any one member. If an engaging story emerges, the satisfaction of the group's achievement is heightened. Conversely, the structure might be more complicated, by exploring non-linear stories that intertwine based on a common theme.

In the realm of dance, performers demonstrate an understanding of improvisational theory through spontaneous and fluid, non-repetitive motions. The dancer's focus should change as appropriate to take into account an exploration of physical space, a range of movements and awareness of other dancers. A dancer's "effectiveness" might be measured by her ability to integrate a range of motion, transformational shapes and transitions between tempos in order to convey an idea or theme. Regardless of the artistic pursuit, playfulness, trust, acceptance and support are essential aspects of the creative process.

3.1 Musical Approaches to Improvisation

"… I was never interested in the notes. I was only interested in the sound, the color, and the shapes of the colors." (Parker) [8]

In the Western tradition, there are three fundamental elements of music; melody, harmony and rhythm. Melody is the focal point of most music. Creating a melodic shift between major and minor modes is a common technique used to influence the tonality, mood, tension and balance within a composition. Harmony is created by two or more sounds playing simultaneously and is primarily as a means

of supporting the melody by adding consonance and/or dissonance. Harmonies can be simple or complex, but rarely dominate the melodic line. Rhythm serves to provide the underlying metric pulse or beat that can have a wide-ranging influence on a composition. All of these elements combine to create opportunities for improvisation that affect the listener's emotional response to the music. For example, the same composition can be interpreted in a myriad of unique performances dependent upon dynamics, tempo, meter, instrumentation, articulation, arrangement and style, to name a few influential musical components. One model of rhythmic improvisation is exemplified in metric modulation. The original pulse is maintained, but the rhythm is played twice as fast in "double time" or slowed down to "half time". The overall mood of the music changes but the underlying tempo is still its original speed. This technique can be very effective in creating an emphasis and release of tension, as well as providing extreme contrast within a composition.

Although improvisational methods vary according to musical tradition, Jazz is widely considered to be one of the most improvisational forms of Western music. Interestingly, the compositional structure of some jazz music is similar to the sonata form from classical theory while jazz standards often follow the AABA form found in popular music [9]. The sonata form presents two themes in the opening (exposition) followed by the transformation (development) of those motives. The ending section (recapitulation) provides a return to the initial themes followed by a coda or musical finale. The AABA form (Verse, Verse, Bridge, Verse) is sometimes used as a framework for improvisation and variations on a theme in the "jazz standard" repertoire [10]. While improvisation doesn't always follow these guidelines, a comparable framework to the sonata form is typical of a dramatic storytelling structure as well.

In classical Indian music, the foundation for improvisation is the raga. The melodic improvisation for each raga is defined by a set of "rules" that are based on combinations of specific notes, phrases, patterns of ascending/descending order, or perhaps the time of day in which a raga should be performed. Vocables are distinct nonverbal sounds, generally untranslatable, that can be used to sing a chant or form a rhythmic vocabulary. Vocables are often used to add temporal variations, repeat pitches and create a rhythmic flow or more defined structure, particularly within unmetered raga melodies. Oral traditions of music-making can be extended into group improvisations by adding personality and using nonsense syllables or vocables as a means of conveying story and emotion.

In African music, drummers frequently trade-off improvisational solo leads with rhythmic cues and breaks for dancers within an arrangement of interlocking polyrhythmic phrases. A variation of this improvisational form has recently emerged in Western cultures in the formation of community drum circles, usually with impromptu session leaders acting as facilitators. Even within an improvisational structure, group dynamics and social interplay are often achieved by directing the players' interaction via distributed leadership [11] and turn-taking behaviors [12]. Playing in a circular physical formation creates an equalizing situation for mutual communication where all participants can see and hear each other in order to contribute fully to the group. [13]. Rhythm provides the universal language that allows people with or without musical training to have an equal role within the community environment.

Parallels can certainly be drawn between musical improvisation and other artistic forms such as painting, sculpture and dance as well. For example, creating a pallet of sounds or sculpting sonic textures are metaphorical approaches to the sound design/compositional process for film, theater, instrumental performance or interactive media including the web.

3.2 The Relevance of Improvisation in Education

"Support and trust go hand-in-hand for performers; they must trust that their fellow players will support them. The only star in the improv is the ensemble itself; if everyone is doing his job well, then no one should stand out." (Halpern) [14]

Open-minded environments are necessary to help students discover how to move beyond the inhibitions of conventional training. Moreover, learning to balance technical ability with emotional and expressive skills in an interdisciplinary ensemble setting can be quite challenging. Being aware of pre-existing work(s), understanding the importance of its' implications and leveraging this knowledge to innovate in new media forms create a framework for the creative process.

Innovation and creativity is taught through guidance and direction, subject to spontaneous input from the students, without individual control over the final product. In the ETC, our focus is on adapting various aspects of improvisation to enhance communication within group settings. "To foster genuine improvisation, protocols must be carefully designed to frame the performance, inspire creative individual expression, integrate the individual into a real or imagined collective, and appear to be non-coercive, or voluntary." [15]

Referring back to the three rules of improvisation, one of the primary reasons to include improvisational exploration in collaborative work is to create a level playing field. To "perform" by telling a story, making up a joke or enacting a character you just created in front of your peers requires a level of humility in presentation that is not normally employed in intellectual discourse. In addition, improvisation allows the opportunity for trust when there is recognition that in order to move forward, the group must depend upon each other.

3.3 Culture and Identity

"Listening is a voluntary process that through training and experience produces culture. All cultures develop through ways of listening." (Oliveros) [16]

Our inclination to explore new media forms is based on identification with cultural affinity – language, story, narrative, character, music, and dance are just a few of the unique attributions that distinguish art and culture. Ultimately, we identify our media experiences and entertainment value through the emotional impact and compelling usage of these elements.

Manovich considers new media as distinct yet interdependent composite layers of culture and computation that result in a variation of computer culture. "…a blend of human and computer meanings, of traditional ways in which human culture modeled the world and the computer's own means of representing it" [17]. New media allows us to create experiences with opportunities for interactivity and improvisation based on layers of action and reaction. Our ability to create new community through random opportunities for social interaction and improvisation within the structure that new media forms provide also affect the quality of experience. Authenticity is another factor that can impact the perception of identity and community. We tend to disregard people or relationships that are disingenuous, thus affecting interpersonal bonds within a group [18]. In virtual communities, identity is often established through the creation of an alias or by more indirect means such as chat rooms, message boards, or avatars where role-playing and improvisation are integral aspects of building community. As in the real world, trust plays a critical role in online communities and can impact one's reputation and ability to participate fully if perceived in a negative light [19].

3.4 Practical Application

Given the disparity of experience in the skill set of our students, we have found it helpful to level the playing field by requiring all students to take improvisation as part of their core curriculum in our program. Since it is the first class they take, there has not yet been time to form social groups or to have any preconceived ideas about working styles, personality types, preferences, and beyond the label of undergrad major, dominant skillsets. The students are suddenly thrown into a situation where all of those characteristics contribute, but none of them count. This premise is extended into other coursework as well. To be placed in a humbling environment from the beginning of the first semester, allows honesty and trust to be established before the actual working relationships are formed in the project groups. In addition, there is a sense of discovery and curiosity that is introduced in improvisation that allows the students to be open to new ideas and ways of seeing old ideas.

As students are subsequently assembled in interdisciplinary teams where they collaborate to build prototypes, they have shared experiences and common language for communication. Schrage describes "shared spaces" as a means for communication, where the prototype itself becomes the "shared space" that is necessary for innovation. "...the notion that more or better communication was the essential ingredient in collaboration was false; what was needed was a fundamentally different kind of communication." [20]. With regard to role-playing, Schrage points out that "Prototypes and simulations lend themselves to being treated as theaters in which participants in the innovation process assume different roles" [21]. Improvisational techniques can help provide more meaningful approaches to communication, particularly in collaborative projects and experiences.

4. PROJECTS

All of the projects in the ETC are based on the collaborative process, but several have afforded unanticipated opportunities for improvisational freeplay. By way of example, the *Virtual Meditation* project (Figure 1) provides a forum for an interactive play by integrating the actions of two members of the audience. The two people are chosen at random and participate by having their voices and digital images recorded, as well as biofeedback measurements of heart rate and Galvanic Skin Response (GSR). This data is used to customize the performance. Depending on the amount each couple improvises and touches each other influences the computer graphics visuals and has also had a varied affect on the audience. In some cases, it has been at least as engaging for audience members to observe the dynamics between the two "actors" as focusing on the play itself.

Figure 1: Virtual Meditation #1

The *Jamodrum* project has created a variety of musical games integrating drumpads and turntable disks for playback of audiovisuals on a custom tabletop interface [22]. Although the games and musical environment are highly structured, players frequently make up their own methods of gameplay in public exhibition settings. Several variations of the *Jamodrum* software elicits a "call and response" behavior as a means of orchestrating the players' experience and allowing opportunities for individuals to take turns in order to hear their contributions to the overall mix. In spite of the underlying musical structure, there are frequent spontaneous demonstrations of free improvisation as participants engage in collective jams on the shared interface. In other situations, players assert themselves in leadership roles and take control once they realize the group needs to work together as a team in order to advance to the next level of gameplay. More playful outcomes have been observed as participants completely abandoned the notion of discrete player stations and danced around the table in time to the music, or invented their own rhythmic patterns for the group to follow. Closely resembling the methods described in section 3.1 relating to acoustic drum circles, constraining the musical space in this digital domain is accomplished through similar facilitation, distributed leadership and turn-taking behaviors.

A *Virpet* is a 3D virtual puppet model that can be manipulated digitally from an input device such as a joystick or midi controller. The *Virpets* system developed at the ETC is being used to create an installation in the Pittsburgh Children's Museum. By integrating digital models of the museum's showcased puppet collection, the *Virpet Theater* project (Figure 2) is exploring new opportunities for storytelling and puppeteering intended for the museum's young audience. Although still in its early stages of development and as yet undecided focus, the user tests have revealed a level of improvisatory play that was never anticipated. It is still to be determined whether this is

a toy or a vehicle to educate young children about the puppets. In one user test, children created a puppet theatre, specifying where the audience would sit and taking turns performing with the puppets for each other. Prior to this, the team had anticipated that the children would interact only within the virtual space. In another test, children simultaneously enacted with their own bodies the same movements they created with the virtual puppets, thus creating a physical and virtual "dance". As a consequence, the *Virpet* team is working on ways to integrate these types of play behaviors into their next-generation development cycle.

Figure 2: Virpet Theater

The *AquaLounge* project evolved from an earlier ETC undertaking called *Magic Mirror* that created interactive games for varying sized audiences using a custom computer vision system. A series of mini-games were developed for the *Magic Mirror* system based on motion detection analyzed and processed from live video. The games were tested in a variety of environments from movie theaters to nightclubs with several hundred people. Audience participation triggered a number of video effects on a large screen visible to everyone. Even though the games provided a framework for gameplay, audiences invariably invented their own methods of interaction. In the *AquaLounge* project (Figure 3), the custom software was modified to include tracking of bright lights and colored LEDs in addition to motion detection and extended applications of real-time image processing. Player participation influenced music-driven effects, flocking behaviors, particle systems and 3D mesh effects in an open-ended environment that encouraged improvisational play.

Figure 3: AquaLounge

The *RetroRobo*t project set out to develop an Augmented Reality game prototype based on location tracking software within a wireless local area network. One of the critical design issues was the two second latency inherent in the tracking software which delayed specific game processes such as scanning for virtual objects and images. For the guest testing, laptops were mounted on rolling carts and participants pushed the carts around the space. Some groups were so excited by the novelty of laptops on carts, that the game became secondary to the collective fun that was achieved by simply running with the carts at high speeds. Although rapid navigation was not originally contemplated as an intended outcome of gameplay, this unexpected approach negated the previously noticeable latency for those high speed participants.

5. OBSERVATIONS

The phenomenon of being immersed in multiple forms of media at a young age is relatively new. As many of our students were born in the late 70's and early 80's and are now pioneers of generation Y, the emphasis on entertainment, computing and gaming is an intrinsic characteristic of their life experience. In particular, the impact of networked media facilitates the formation of new relationships within local and online gaming communities. The emergence of these spontaneous communities offers a multitude of opportunities to interact with real and virtual characters and create meaningful experiences through random improvisation. Furthermore, the affordances provided by the development and innovation of new prototypes and the relationships forged through group collaboration can be enhanced greatly with the integration of improvisational play methods. As educators with musical and theatrical perspectives, the authors take inspiration from methods discussed herein to enhance communication and improve collaboration amongst our students.

6. CONCLUSION

Improvisational techniques can establish a framework for more effective communication, enhanced creative potential, stronger leadership and positive bonds between individuals and the group. Freely accepting the ideas of others, building upon them in a non-judgmental way and exploring creative approaches to conflicts are part of the team process. Setting up a playful environment that promotes risk and embraces failure is a key element to collaborative research, development, and learning. Most importantly, this preliminary exchange of ideas with regard to improvisation, collaboration and education is a topic that we hope to investigate further.

7. ACKNOWLEDGMENTS

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