

# Improvisation for Technically-Oriented Peoples

Russell McMahon  
mcmahor@ucmail.uc.edu / University of Cincinnati, USA

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**ABSTRACT.** Teaching “soft” skills to technical people is just as important as learning “hard” skills. Improvisation techniques can also be used in teaching technical concepts such as cybersecurity, agile development, database design, programming concepts, and most importantly how to better one’s communication skills. In an age where rapid changes have become the norm, improvisation techniques can be used to help navigate the new challenges of the next generation careers, global interaction, and technologies. These techniques can easily be incorporated in other methodologies such as creative problem-solving and design thinking. There are clearly defined and flexible rules for improvising, which make it easier for technical persons to learn and use in their daily life and career.

**KEYWORDS:** improvisation, innovation, creative problem-solving, technical education

## Improvisación para personas con orientación técnica

**RESUMEN.** Enseñar las habilidades “blandas” a las personas técnicas es tan importante como aprender las habilidades “duras”. Las técnicas de improvisación también se pueden usar en la enseñanza de conceptos técnicos como la ciberseguridad, el desarrollo ágil, el diseño de bases de datos, los conceptos de programación y, lo más importante, cómo mejorar las habilidades de comunicación. En una era en la que los cambios rápidos se han convertido en la norma, las técnicas de improvisación pueden usarse para ayudar a navegar los nuevos desafíos de las carreras de la próxima generación, la interacción global y las tecnologías. Estas técnicas pueden incorporarse fácilmente en otras metodologías, como la resolución creativa de problemas y el pensamiento de diseño. Existen reglas claramente definidas y flexibles para la improvisación que facilitan que las personas técnicas aprendan y usen en su vida diaria y carrera.

**PALABRAS CLAVE:** improvisación, innovación, resolución creativa de problemas, educación técnica

## 1. INTRODUCTION

The first known use of improvisation goes back to the Atellan farce (*fabula Atellana*) dating back as far as 391 BCE, but it seems to have faded by 55 BCE according to Cicero [12] and no written records appear to exist past the first century CE [7]. In the 1500s, the improvisation art form was revived through the *commedia dell'arte*. Although it was performed in an unscripted format, the characters, plot, and locale were pre-set. It lasted until about 1800 and died out, in part, due to the political nature of the shows themselves, which led to suppression and eventual outright banning.

Improvisation was resurrected as a theater art form in the 20th century through the independent work of Viola Spolin and Keith Johnston. Spolin defined what improvisation theater in the US would look like through her book “Improvisation for the Theater”, which was first published in 1963. Johnston wrote “Impro: Improvisation and the Theatre” and created Theatresports. It is through the work of these two that improvisation was codified and advanced in such a way that it could be applied in many STEM (Science, Technology, Engineering, Math)-related fields.

I started taking formal improvisation classes in January 2017 from a local improv company and have continued to do so even today. In September 2017, I began to give improv talks/workshops at mostly academic-related conferences. Over the next year, I spoke at a total of seven national/international conferences. In October 2017, I attended the Midwest UX (User Experience) conference where I took a workshop on improvisation from Mike Gorgone, a computer scientist, who learned improvisation from both The Second City and iO improv companies. His focus has been applying improvisation techniques to help UX designers produce digital products. Interestingly, Dick Costolo, the former CEO of Twitter, was a computer scientist and an accomplished improviser who studied improv while living in Chicago as well.

In February-March, 2019, I worked at Miras University in Kazakhstan on a project entitled “Multilingual Education via Interactive & Cognitive Teaching”, which was out of their Computer Science and Information Technology department. I conducted improv workshops for both their technical faculty, English faculty, and also elementary and high school English teachers from the region.

## 2. BASIC RULES OF IMPROVISATION

The seven rules used here come from The Second City and are as follows: listen, use “Yes, and”, create an ensemble, co-create the story, be willing to change, use failure to improve, and follow the follower. Improvisation is fluid, which makes it a good tool for creative problem-solving.

Improvisation can be thought of as a method where the group begins in chaos, which gives rise to order (and, eventually, return to chaos).

Active listening is a “muscle” that needs to be exercised and requires the following focus areas: the words themselves, the emotion behind the words, the perceived intent of the words, and that the listener is in the moment and not thinking of what s/he may be planning to say. Listen and only respond to what is heard. When someone speaks to you, treat it as a special gift and acknowledge it as being so.

By saying “yes”, one affirms the speaker and by saying “and” (as opposed to “but”), one indicates the intention to build on the speaker’s words. In this way, a story is built brick by brick. Such a method can take the performers (or problem solvers) to unexpected places and it may make one feel a bit at ease; however, it is a way of keeping a clear line of communication open. Affirm, build, and be non-judgmental are keys to this phase of improvisation. In the early days of IBM, the company’s motto was “THINK”, but in improvisation it is best to “don’t bother to think” as some of the best lines and ideas often come when performers say what is on their minds at that moment.

The word “ensemble” is purposefully chosen as opposed to the word “team”. An ensemble of musicians, for instance, is brought together with the idea that it will create a beautiful musical piece: it is the whole that is important, not the individual. The word team is often used to mean this as well; however, in terms of athletics, teams imply that some level of competition was needed in order to be a member of such teams, and that one can easily be replaced if injured. An ensemble preserves the talent and the collaborations are highly synergistic. In order to be successful, ensembles must be in the moment, give and take, and surrender the right to be right (the last one is hard even in brainstorming sessions).

The focus here needs to be on finding “the idea”, not one’s own idea. This means that one must be willing to cede control, which can be difficult. During this time, one needs to avoid asking questions as this can be seen as: blocking the idea from being developed, an attempt to force justification, avoidance, or just not wanting to participate. During this time of co-creation, a few basic rules of civility and behavior are needed. Basically, share the stage and treat every member with respect. Finally, it is important to remember that while some words or sayings may be funny to one person, they can be interpreted by another as having a negative connotation.

Changing oneself is very difficult and changing others or an organization is nearly impossible without first focusing on oneself. It also involves risk taking on one’s part. Improv can help in developing this as one is constantly faced with new ideas that s/he must adopt in order to keep a story moving forward. Taking risks has become a normal part of Silicon Valley and the startup mentality as a whole for quite some time. While failure is possible, the potential of a big monetary payoff seems to make it worthwhile. In the improv world, risk-taking and

failure are how actors improve their future performances. Improv also helps one learn how to fail in public, which can be very embarrassing and even emotionally upsetting if one is not trained for the possibility.

It is not about being the best or perfect at that moment, as much as it is about being in the moment and embracing the concept of life-long learning. In the classes attended by the author, we used the word “Ahougá” when we made a mistake or faux pas of some sort. There are some improvisation exercises which have the purpose to force mistakes on the team members. This teaches one how to move forward when a mistake is made without getting caught up in judgmental back-thinking.

Spolin stated “Don’t initiate! Follow the initiator! Follow the follower.” All of us have the ability to lead, and there are times when it is better for executives to step back and allow others to take over. Let things grow organically and see where they take the ensemble. Too much direction from the top tends to negate ideas from the bottom and can stifle innovation.

### 3. LITERATURE REVIEW

There is a fair amount of relevant research, articles, and talks on the use of improvisation outside of the theater. The articles reviewed show that improvisation can improve one’s communication, collaboration, creativity, and problem-solving skills.

1. “Beyond Productivity: Information, Technology, Innovation, and Creativity” edited by William J. Mitchell, Alan S. Inouye, and Marjory S. Blumenthal [10]. This is a rather lengthy book with a theme revolving around the importance of combining both the arts and STEM disciplines in order for the next generation of problem solvers and innovators to be successful. It is stated that this is “also an opportunity for each field to gain fresh, sometime uncomfortable, perspectives on itself.” It is pointed out that Pixar co-founder, Ed Catmull, embraced improvisation as a way to teach better collaboration within teams. The authors state that improvisation has a place in human-computer interaction or HCI. Finally, there are several references made to George E. Lewis, a professor of American Music at Columbia University, who said, “Improvisation is about finding structure, not imposing it.”
2. “Changes in Anxiety Following a Randomized Control Trial of a Theatre-based Intervention for Youth with Autism Spectrum Disorder” by Blythe A. Corbett, PhD, Scott D. Blain, Sara Ioannou, and Maddie Balser [3]. Their work indicates that improvisation techniques can be used to help people on the autism spectrum disorder (ASD). They point out a number of studies and suggest that additional work in this area is needed. They created the Social Emotional NeuroScience Endocrinology (SENSE) lab “to better understand the social and emotional functioning of children

- with autism and related neurodevelopmental disorders and to translate findings into meaningful approaches and interventions.”
3. “Education in Professionalism: Improvisation” by Richard B. Gunderman, MD, PhD [6]. This paper looks at how Dr. David Fessel, MD, a musculoskeletal radiologist and faculty member at the University of Michigan, took classes on improvisation and eventually became a member of The Second City Conservatory. His primary reason was to overcome his initial fear of giving presentations, but eventually he realized that there was much more to this. He learned that improvisation reaches far beyond that of comedy and can be applied to the medical profession in terms of teamwork, collaborative communication, relationship building, learning, and self-awareness.
  4. “Humour-in-the-loop: Improvised Theatre with Interactive Machine Learning Systems” by Kory Mathewson [9]. Mathewson is an accomplished improviser and, in 2015, he began his work on creating an AI system that could engage in improvisation with a human. He developed a set of Turing test rules that could be used to show success. He collaborated with Rapid Fire Theatre on this project and it is also here where he created the improvised theater experiment called Improbotics.
  5. “Improv for Effective Collaboration Innovation?” by Jeannie Kristufek [4]. In this paper, the author presents several exercises used at IBM that she adapted from the improv world to help technical team members work more creatively and efficiently as part of a collective whole. A key component of improvisation is that it is a team effort and that no “star” exists. Everyone is tasked with contributing to the task at hand and one must listen to the other team members even if there is disagreement. Using a “Yes, and” approach allows team members to avoid the value judgment of ideas early on and keeps the discussion going. Several other key components of improv that she points out are: “show, don’t tell”, take risks, be in the moment and the know.
  6. “Improvisational Computational Storytelling in Open Worlds” by Lara J Martin, Brent Harrison, and Mark Riedl [8]. Improvised storytelling allows the actors to place their characters in whatever universe and situation they wish based upon a simple suggestion from someone in the audience: in essence, what is referred to as an open world. The authors are researching how to do the same with an AI system that would be capable of improvising with humans in real-time alongside humans. They offer two possible approaches to help solve this problem: plot graph and neural network. Neither solution is perfect and much more needs to be done, but the goal is to develop an AI system that can communicate with humans at even some of the most abstract worlds that improvisers are good at creating.
  7. “Improvisation: Methods and Models” by Jeff Pressing [11]. This paper was written in 1987 and, although it is mostly on musically improvisation, many of the ideas

could easily be applied to theater improvisation as well. Even more interesting is the section on artificial intelligence that Pressing examines. Pressing notes: “There is traditionally no explicit mention of improvisation in the field. In making such a link, it seems clear that the successful application of AI concepts to improvisation rests to a large degree on the appropriateness of considering improvisation to be a kind of problem-solving.” He proceeds to discuss how improvisation is really a form of problem-solving in terms of a chosen search method and selection of an acceptable solution through problem reduction.

8. “The Use of Improvisational Theater Training to Reduce Social Anxiety in Adolescents” by Peter Felsman, Colleen M. Seiferta, and Joseph A. Himle [4]. This was a study conducted in Detroit in cooperation with The Improv Project, which is a part of the Detroit Creativity Project (DCP). The authors state, “This study is the first to test the efficacy of a school-based improvisational theater program as a mental health intervention, and it offers positive results.” The focus was on those youth who suffer from a recognized social anxiety disorder such as depression or social avoidance. I met with Beth Hagenlocker who is a co-founder of the DCP and in charge of the day-to-day operation of The Improv Project. During a 10-week period, students transition from the basic improv exercises to a graduation performance. There are others doing similar things such as Urban Improv in Boston, which is a part of Rehearsal for Life.
9. “Whose Classroom Is It, Anyway? Improvisation as a Teaching Tool” by Ronald A. Berk and Rosalind H. Trieber [1]. The focus was on using improvisation as a better way to engage and teach the Net Generation students. The authors used the following four improv exercises to demonstrate how this can be done: One Word at a Time/One Sentence at a Time, Speech Tag, Freeze Tag, and Gibberish Expert Interview. Their four reasons for using improvisation in the classroom are: 1. it is consistent with the characteristics of the current generation of students; 2. it taps into students’ multiple and emotional intelligences; 3. it fosters collaborative learning; and 4. it promotes deep learning through the active engagement.

#### 4. IMPROV EXERCISES

Below is a look at the exercises used by the author along with a brief summary.

Table 1  
*Improv Exercises Used by the Author*

Most exercises can be found in the Improv Encyclopedia, Improv Wiki, Drama Toolkit, and Learnimprov.com although the names may be different	
1	Shake 8s; Circle up -- A great warm-up exercise.
2	Zip-zap-zoop; Woosh-bang-pow -- Any three-word/sound combination is fine.
3	These are five things -- "Don't bother to think"; just do.
4	Follow the follower or the leader -- Great exercise and fun as people imitate others.
5	Last word spoken = first word spoken -- Forces one to concentrate.
6	New choice, redo -- I refer to this game as "refactor" which is a term used by programmers when they rewrite some of their code.
7	Double-link list -- In a circle, point to someone saying a "noun" you think of. Once the loop has gone around, repeat the cycle using the same words. Build on this by adding another round with a different set of words to see how well you can remember your word(s) or that/those of others. Use "pointers" (fingers) for navigation of the circuit.
8	Zombie/hacker attack (10-14 people) -- Have the same number of chairs as participants, which means one will be empty. The zombie walks slowly toward the empty chair while the others create a team strategy to cover.
10	Botnet, distributed denial of service or DDoS attack -- A winker (bot herder) creates a botnet that s/he can later command to attack a victim.
11	Bomber-protector -- Use 8-14 people; each person identifies one person as his/her bomber (therefore to be avoided) and another person as his/her protector (therefore wanting to stay as close as possible to).
12	Two- or three-headed experts -- Answer a question with either one word or one sentence at a time.
13	Four squares -- Four players with the front two being given a topic they will discuss; the entire square rotates to allow all actors the opportunity.
14	Circle story -- Any topic you want and everyone contributes to the story.
15	Emotion zone -- Allows for team members to work with different emotions.
16	Status game -- Use a deck of cards. Treat others based upon their perceived status.
17	Alphabet circle -- Use the alphabet to tell a story.
18	Knife-cat-baby throwing -- This is about object work and concentration.

## 5. CONCLUSIONS

There are anecdotal works, testimonials, and research that support how improvisation can help everyone become better researchers, technologists, teachers, entrepreneurs, team members, and humans. Since 2016, Northeastern University's computer science majors have been required to take a drama class which includes improvisation. [2] This is done, in part, in

an attempt to “robot-proof” their majors, as well as giving them better teamwork and creative problem-solving skills. The area of AI research has begun to look at how improvisation theater can be used to help develop better AI systems.

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