

**If the Shoe Fits:  
multiple intelligences in user-centered design education**

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The time of the one-size-fits-all approach has passed. As Carl Jung once said, “The shoe that fits one person pinches another,” but we are finding that a lot of things still come in either small, medium or large. These three standard sizes are also reflected in our educational system, which measures intelligence by the three R’s (reading, writing and arithmetic) and assumes that all students’ learning styles are identical.

About the same time that Apple introduced a more personal style of computing (putting control in the hands of the individual user), Howard Gardner, psychologist and Hobbs Professor of Cognition and Education at Harvard, introduced his revolutionary theory of Multiple Intelligences (the unique “footprint” of intelligence and creativity found in each individual). As digital technology evolved into the multi-sensory experiences of interactive media, we began to recognize the individuality of our students’ abilities and the importance of personal context in design education and the process of making meaning.

As no one would wear the same shoes for dancing, rock climbing or walking down the red carpet, our approach to designing user-oriented learning systems needs to offer different or multiple layers of support for students with diverse abilities and backgrounds. Our purposes: the tasks we perform, the jobs we have, our families, cultural histories, goals, and life experiences, all differ, so shouldn’t we teach to fit these individual differences? Can Gardner’s multiple intelligences contribute to the future history of design education?

For hundreds of thousands of years the brains of homo sapiens have evolved into separate organs or information processors. We all have a full range of these modularities, or separate processing devices and each of us have developed these faculties into what some might call our own talents or abilities.<sup>2</sup> Gardner calls these distinct way of knowing or representing the world multiple intelligences. To date, he has identified eight and a half of these potentials: bodily kinesthetic, visual-spatial, linguistic, logical mathematical, musical, interpersonal, intrapersonal, naturalist, and spiritualist (the later is tentatively labeled a half intelligence indicating Gardner’s vacillation in the number and boundaries delineating these capabilities).

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1 Jung, Carl. “The Individual.” 28 July 2004 <[http://quoth.nexusvector.net/wiki/The\\_Individual](http://quoth.nexusvector.net/wiki/The_Individual)>.

2 Gardner, Howard. *Intelligence Reframed*. New York: Basic Books, 1999. 32.

Like shoemaking, the use of these intelligences is not simply a matter of unbridled computational power, but the result of effort directed towards building a useful product or carrying out a task which is valued by the culture and employs individual strengths and abilities. Someone with bodily kinesthetic intelligence is likely to solve a problem with a hands-on approach, manipulating materials to build something, while the same problem may be approached by someone with linguistic intelligence using a story or filmic narrative.

Each intelligence relies on personal context, biological and psychological potentials based on the interaction of personal genetics, life experiences and cultural conditions of the period. No two people have exactly the same “footprint” – a unique combination of intelligences. We each exhibit our own understanding in one or more diverse symbols systems (linguistic, musical etc. )

Although we have the capacity to develop potentials in each of these areas, both our ability and drive to do so is inextricably bound with the human and artifactual resources available to us as well as environmental contexts.<sup>3</sup> Interactive learning objects provide resources for students to learn, express themselves and develop their skills in any combination of intelligences. Those gifted in particular intelligences, will accomplish more if they are given access to materials which sufficiently engage and develop their potential. Without access to an instrument it’s difficult to gain the knowledge and experience necessary to become a musician.

Context (what surrounds, opposes or informs us) also influences achievement. History, education, economics, personal experiences, special interests, desire to be accepted by peers, or any number of other global, local or personal contextual issues affect the development of our skills. Changing capacities such as age, health and emotions may also alter the cultivation and use of our personal abilities.

Anthropologist Margaret Meade, studying cultural contexts in remote regions of the world, found that different values encourage distinctly different behaviors and abilities. People whose intelligences do not match what is valued by the culture will not be rewarded or fulfill their capabilities. If mocked, considered an outcast, or otherwise penalized for particular actions, the behavior will most likely be abandoned. Lucky for us the computer geeks of the 60’s and 70’s didn’t mind criticism.

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<sup>3</sup> Gardner, Howard. *Creativity and Leadership*. Los Angeles: Into the Classroom Media, 1998.

Context is fluid and dynamic. Our behaviors and decisions are always changing. As a child, a teenager, or an adult, for example, we have different concerns and make different choices. Surely none of us would chose now to wear the same shoes we wore when we were six years old (even if they were available in our size).

Although generalized fit addresses a wider audience, this generic approach does not always provide the support or comfort necessary to develop individual potentials. At the beginning of the 20th century most shoes were made on absolutely straight forms producing no visible difference between a right and a left shoe. Both were constructed exactly the same and were available only in limited sizes and widths. Although it may at times seem to be the case, no one actually has two left feet.

Universal sizing in education, forcing individuals to conform their abilities (without considering context) to meet achievement targets set by standardized tests, was formalized in France in 1900 when Alfred Binet developed the first IQ test. Created to measure and reward primarily math and verbal skills, the Intelligence Quotient was based on the premise that ability does not change with age, training or experience.<sup>4</sup> Intended to predict future academic success, like the SAT, ACT and GRE, these tests are the bane of our current education system.

Throughout the development of both our system of teaching and the evolution of footwear, little attention has been paid to qualities of either fit or comfort. In fact, during the Medieval period extravagance in style grew to such an extreme that it was necessary to pass a law to prohibit use of the Crackow, or peaked toe shoe, which had reached such a great length that walking was nearly impossible.<sup>5</sup>

Design programs which promote style and emphasize a single point of view, mass produce students without personal direction or usable knowledge. Using interactive media in our classrooms isn't enough – we need to utilize a communicative paradigm to model our own teaching that promotes multiple and mutable meanings. The multiple communicative channels (animation, audio, images, text, video, etc.) provided by interactive technologies are a perfect fit with the multiple intelligences. “Smart” applications adjusts their direction depending on user response, making such individual customization feasible, but effortless and fluid.

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4 Gardner, Howard. *Multiple Intelligences*. New York: Basic Books, 1993. 237.

5 “The History of Your Shoes.” 28 July 2004,  
[http://www.shoeinfont.com/about.shoes/history\\_your\\_shoes/history\\_yourshoes.html](http://www.shoeinfont.com/about.shoes/history_your_shoes/history_yourshoes.html).

## MIs in the Design Classroom

“Knot haul grate mines stink a light”<sup>6</sup> (not all great minds think alike).

Understanding the immense differences in how individuals acquire and represent knowledge provides a foundation for incorporating them into teaching and learning. For education to be most effective these differences should be taken into account. According to information architect Richard Saul Wurman, “Knowledge can only be gained by experiencing the same set of data in different ways, and therefore, seeing it from different perspectives.”<sup>7</sup>

We need to shape programs which are custom-made and provide individual support, rather than restrict ourselves to merely fixing or repairing a worn-out education system. A custom-made shoe or educational experience is constructed to follow personal needs – it’s unique. Unlike any other (including the shoe on your other foot), it conforms to every bump, curve or experience, taking into account personal abilities, context, overall body structure and health as well as its intended use.

How can we apply or integrate this individualized approach into design education?

**Welcome diversity.** Encourage and celebrate differences.

Value individuality.

**Consider context.** Every class and every individual is different.

Have empathy. Consider users. Put yourself in other people’s shoes.

**Introduce diverse tools and materials.** Allow each student to indulge in a variety of tools and materials to determine what feels most comfortable or fits best, like trying on shoes. For example, some might demonstrate understanding through words, others through pictures, sound or motion. Provide flexible technology. Allow students to pick and choose their symbol systems. Only they can determine the fit and know if something conforms to their personal requirements.

**Provide diverse human resources.** Include faculty with diverse areas of expertise, cultural backgrounds, experiences, and approaches in mentoring students. Foster peer-learning. Varied or even conflicting perspectives can lead to deeper thought and understanding.

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6 Connecticut Odyssey of the Mind, 1998.

7 Wurman, Richard Saul. *Information Anxiety*. New York: Doubleday, 1989. 28.

**Design projects rich with possibilities.** Avoid using a formulaic approach. Consider themes. Encourage multifaceted solutions. Establish a framework for exploration and discovery that encourages each student to develop a variety of cognitive models. Experience designer Nathan Shedroff has found that the “key to the development of cognitive models is the diversity of people’s learning styles and abilities [...] Since everyone has different skills and experiences, no one way of organizing data is capable of creating understanding for everyone [...] Multiple views and other redundancies may seem like a waste of time and resources, but the duplication is critical to creating understanding for a variety of people.”<sup>8</sup>

**Use entry points.** Attract student interest. Stimulate learning with an environment with gateways to discovery. Incorporate numerous symbol systems, frames and intelligences in your delivery. Support diverse learning and encourage students to utilize their individual intelligences. Invite aesthetic, hands-on, narrative, numerical or quantitative, logical, existential, and social points of engagement.

**Encourage exploration.** Support experimentation. Foster self-discovery. Suspend making judgements which might deter risk taking. Reward failed attempts. Allow flexible paths. Emphasize process and encourage lateral thinking. There are many ways to solve a problem or reach a goal.

**Provide examples.** Motivate students with analogies or metaphors. Help them to better understand new concepts through what’s already familiar to them.

**Spend time, give attention.** Plan adequate time for sustained attention on projects. Whenever possible, get to know students as individuals. Have contact with them over a period of time and monitor their development. Encourage self-discovery. Help students identify their individual intelligence profile. Use MIs, but to help students learn and communicate content, not to categorize people.

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8 Shedroff, Nathan. *Experience Design*. Indianapolis. New Riders, 2001. 72.

**Encourage collaboration.** Match students with others having complementary learning styles and intelligences. The interaction of a team approach teaches respect and tolerance. Remember the sum is greater than its parts.

**Provide varied assessment.** Encourage consistent hard work. Vary modes of outcome assessment to account for various learning styles. Offer prompt, meaningful, and constructive feedback. Hold group critiques and invite guest critics.

We can continue to ignore uniqueness in our approach to educating the next generation of designers and utilize standardized small, medium, and large approach of mass production, or we can chose to embrace our differences.

With current information on multiple intelligences, a multicultural classroom, and customized smart-media technology there is no more reason to teach in a single uniform way than there is reason to wear ill-fitting shoes. Individually configured education can be compatible with required standard curriculum. We can construct pedagogy and outcome assessment which works effectively with this multilayered approach.

The challenge we face helping our students stand on their own two feet as they prepare to enter the profession may not be unique, but each individual is. To get them off on the right foot, we should teach them to understand and use their own individual abilities and preferences to create personal context and meaning. The development of an individualized design process is tantamount to designing unique and creative solutions which contribute to the culture. So lace up your kicks and step into the future.