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"Intelligences That Plants Can Pass On": Play Dough, Fun and Teaching Strategies with Insights to Multiple Intelligences

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Abstract

The "Intelligences That Plants Can Pass On" is an activity that involves several of Gardner's Multiple Intelligences and was designed for demonstrating the practical use of Multiple Intelligences in delivering education programs to all ages of learners. Instructions are provided for how to implement this activity, and the activity is linked to teaching and learning concepts. In addition, the Charette Teaching Strategy is explained. Practitioners are encouraged to incorporate the concept of Multiple Intelligences in their teaching.

Introduction

The "Intelligences That Plants Can Pass On" Activity was developed to demonstrate practical use of Multiple Intelligences (MI) in delivering education programs to all ages of learners. The activity provides a great portal to quality lesson planning. It has been used from 2003-2012 in elementary and science teacher in-service trainings, Junior Master Gardener (JMG) Volunteer Certification, the Boise School District/Boise State University dual enrollment Elementary Teacher Intern (ETI) Program for High School Students and in adult education workshops to better integrate MI lesson planning and improve teaching strategies.

Teaching Strategies: From Exposition to Inquiry

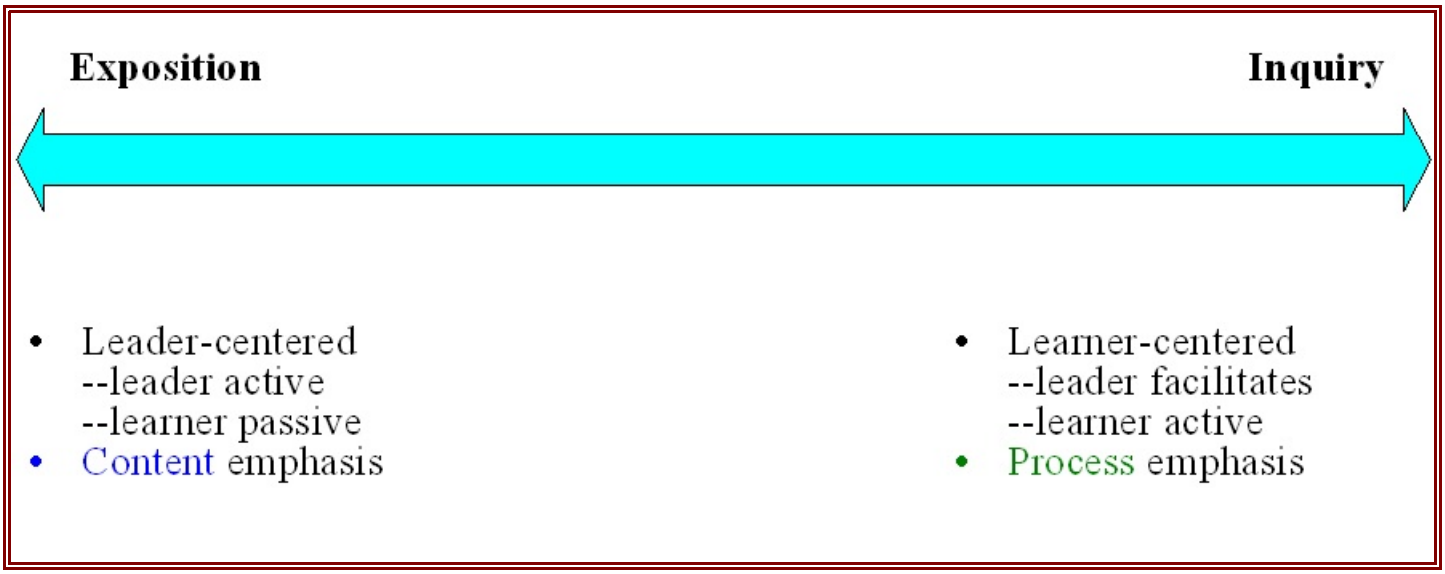
In general, exposition is considered instructor or leader-centered with an emphasis on content delivery while inquiry is considered learner-centered with the emphasis on the process of learning. In a typical learning situation, this suggests that for exposition, the leader is actively involved (e.g., lecturing, reading aloud, showing a video) and the learner is passively taking in the information (e.g., listening, reading an overhead, watching a video). In contrast, learners engaged in inquiry are actively involved (e.g., conducting investigations, processing information and data) while the leader's role is to help facilitate the process of learning. Exposition and inquiry represent the two ends of a continuum with teaching methods in

between that have more or less of the characteristics of the two extremes (see Figure 1).

Key Concepts in Multiple Intelligences

Howard Gardner (1993, 1999) suggests that intelligence has more to do with the capacity for (1) solving problems and (2) fashioning products in a context-rich and naturalistic setting. Gardner describes nine Intelligences that relate to learning and educational practice: (1) Verbal-Linguistic, (2) Logical- Mathematical, (3) Visual-Spatial, (4) Musical, (5) Bodily-Kinesthetic, (6) Interpersonal, (7) Intrapersonal, (8) Naturalistic, and (9) Existential (Spiritual).

Figure 1: Teaching Strategies Continuum



Using teams of assembled learners to introduce and demonstrate each of the intelligences using posters [Kuntzler, B. (1998) *Kid Smart Poster Set* and Lazear, D. and Margulies, N. *Tap Your Multiple Intelligences Poster Set* (1995)] has been a wildly successful way to awaken these ways of knowing with educators. Paired with an individual inventory of MI preferences, it ushers in new ways of instructional delivery. Engaging the whole class in reviewing the theory brings light to a broad spectrum of learners. Information about learning styles and Multiple Intelligence (MI) is helpful for everyone, especially when identifying one's own abilities and disabilities. Special needs learners and those with attention deficit disorder especially appreciate facilitators of learning that use MI to deliver lessons. Knowing one's MI preference helps develop coping strategies to compensate for weaknesses and capitalize on one's strengths in learning.

Individuals that can relate Multiple Intelligences (MI) to teaching and learning practice are more effective in knowledge transfer (Silver, Strong, & Perini, 2000). Educators need to know how they can apply MI Theory to today's learners (Bruetsch, 1995, 1999). Application of this theory enhances team building, assessment, productivity and knowledge gain among all ages of learners (Armstrong, 2000; Lazear, 1998). Discussing levels of MI application from awareness to actualization can link, bridge, and connect the dots of MI to the context of individual learners. Research suggests actualization of MI within the

education and training community will enhance learning and behavior change among all types of learners. More information about Howard Gardner and the Theory of Multiple Intelligences can be found at:

http://web.ccsu.edu/library/curriculumlab/bibliographies/multipleintelligences.htm
http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks3/ict/multiple_int/index.htm
http://www.edutopia.org/key-learning-community-video
http://www.pz.harvard.edu/PIs/HG.htm
http://www.theatreinmotion.com/resources.htm
http://www.thomasarmstrong.com/multiple_intelligences.htm
http://www.ldpride.net/learningstyles.MI.htm

For the past 21 years Dr. Kevin Laughlin (2001) has been using MI methods in designing and delivering learning experiences with formal and non-formal audiences of youth and adults. In addition, he spent from 1996-2001 examining and testing the use of Multiple Intelligences with 45 educators in Oregon, Washington, and Idaho as part of a mentoring process. During his research observations, he found the following four practices were key to practitioners' successful development as facilitators of learning: (1) Being (inquiry) learner-centered vs. (exposition) instruction centered; (2) Using at least 4 MI approaches to support key content presented; (3) Dividing content in half and then half again before arriving at final lesson plan; and (4) Planning lessons based on the key outcomes (taking learners where they are at; going in depth into a topic; and helping learners be metacognitive about each topic) of the National Research Council Study, *How People Learn-Bridging Research and Practice* by Donovan, M., J. Bransford, and J. Pellegrino (1999). Delivery improved and application of ideas and core concepts advanced to all learners were benefits. Incorporation of Multiple Intelligences into regular teaching strategies ("Teaching Strategies," 2012) empowers students, faculty, staff, and the people in our communities. The MI message needs to be shared with all types of educators.

"Intelligences That Plants Can Pass On" Integration Activity

The art and science of gardening naturally leads learners from doing a subject to understanding the connection between all parts of life and learning (Kiefer & Kemple, 1998). The "Intelligences That Plants Can Pass On" activity, which focuses on plants, demonstrates most of the Multiple Intelligences in a single 75 minute lesson. It integrates art, math, plant science, leadership, language arts, music and social sciences. Using play dough is a sensory activity that also supports emotional development; it renews the learner's connection to their fine motor skills (LeFebvre, 2008). Play dough stimulates imagination and creativity and when linked to the natural world (outside) stimulates amazing learning.

To begin the lesson, introduce and discuss what play dough is; a product of the land, often made from grains (such as wheat, barley, or oats) even potatoes. What types of grains, plants are grown in your state or province that can be used to make play dough? It is made of flour, which is the seed part of the plant. Though commercial play dough can be colorful, home made play dough (LeFebvre, 2008) engages students in their own learning. As an extension, teachers can use native or introduced plants to dye the dough as an intriguing botanical aspect of this lesson. To bring natural colors to life in your dough, use children's or native plant books on dyes (Corona 1989; Richards & Tyrl, 2005). Before of after this activity, invite Native American elders or other ethnic group craftsperson's in your community to bring stories of using natural dyes in cloth or using herbs and roots to enhance the sense of place that is part of this lesson.

This activity was first used to introduce basic plant concepts to science teachers and youth garden educators. In Chapter 1 of the *Junior Master Gardener Teacher/Leader Guide* (Whittlesey, Seagraves, Welsh, & Hall, 1999) the focus is on plant growth and development. The original Junior Master Gardener (JMG) "Pass it On" Activity is in Chapter 8 on Life Skills and Career Exploration. The "Intelligences That

Plants Can Pass On" activity has a team building focus that still works but is amplified in its use to demonstrate aspects of Multiple Intelligences Theory. The kinesthetic activity in silence with the play dough inspires creativity. The resulting poems, haiku, stories, or songs always surprise and delight all participants. Key to successfully doing this activity is to have participants move counterclockwise in silence when constructing the art work. In addition, the fun and enlightenment comes when using the modified Charette teaching strategy near the end of the lesson. This strategy facilitates all learners to guess which art work is connected to which poem, story or song. In most cases there is a grin on all faces, and most vow to do it again in their club, classroom or with their staff. A variation of the steps to implementing this Integration Activity is presented here:

1. Distribute play dough to each participant.
2. Take play dough and divide into two equal size balls (teaches estimation; 3rd grade Standards)
3. Keep one ball and divide the other based on the number of participants (This teaches Fractions) at your table or station.
4. Selecting one of the divisions, the big ball, create something botanical, horticultural or dealing with gardening. (you have one minute)
5. Now rotating counter clockwise (to the left) in silence, add to the other persons creation without talking and interpret what they have portrayed with play dough. Use an equal portion at each station. Add to the previous creation with the new color.
6. When you arrive back at your own creation, study it for a minute and determine what has happened.
7. Now describe in one minute what you started with for the group and what it has become.
8. Indicate if you like it better now then when you started (this teaches team building--Chapter 8 JMG–and fosters creativity).
9. Now write a poem, short story, haiku or a song (sing a song) about the play dough creation on poster paper.
10. Use a modified Charette approach to have the entire class (stand around) examine and uncover the art work that relates to each written or oral description, or have another outside person or group guess which written work is associated with the play dough creation. (teaches language arts)
11. Debrief and discuss links between plant science, art, math, music, and language arts associated with this lesson. Discuss how it reinforces key concepts in instruction and is based upon multiple intelligences theory.
12. Post or display works for people to consider.

The "Pass It On" activity meets the following 2011 Montana Core Competency: Reading Standards for Literature K-5:2, 3, 5, 6, 7, &10; Speaking and Listening Standards K-5:1, 2 & 5.Speaking and Listening Standards 6-12:2 & 5; Math Standards 3-8: Estimation, Fractions, Geometric Measurement. (Adapted by Dr. Kevin Laughlin, Idaho JMG Coordinator, as part of Idaho JMG facilitator training 2001-2007 to support integration of Multiple Intelligences theory with, Idaho Achievement Standards, and plant science education; Adapted for Montana March 2012)

Charette (Design) Teaching Strategy

The term "Charette" ("Charette," 2012) initially appeared in the early part of the late 1800's. Architecture students in Paris who needed to rush their drawings to the Ecole Des Beaux-Arts placed them on a cart which was called a "charette". Later the word broadened its meaning and came to describe any intense, short-term student design project. Today the word is used by the architectural community at large to describe any intense, on-the-spot design effort. The American Institute of Architects (AIA) now commonly provides design charettes to qualified communities around the country by bringing together design experts for an intense 3-day effort, called RUDAT (Regional Urban Design Assistance Team). This is most often

done for community planning and is used by professionals for specific projects, especially those in remote locations.

The Charettes' application as a teaching strategy takes a practice from the real architectural world and demonstrates its application in individual lessons. In the "Intelligences That Plants Can Pass On" activity, the lesson concludes as each group (table) selects a reporter who presents their art surrounded by a Charette of standing peer learners. Without individually identifying who created the original art or who wrote the language arts/musical description, each groups selected reporter shares about the art. After listening to the description and viewing the art, the simple act of pointing to the work brings ahhhs, smiles and sometimes tears to the group and/or the creator. Many participants keep their written work and take pictures of the creation before it is returned to containers. The team building aspect of this activity is subtle. Asking the group if they liked the work more at the beginning or at the end of the table/group activity in almost every case provokes discussion. Participants acknowledgment of the creativity and the interaction fostered is often surprising for self and teams that may not have worked well together before. The counterclockwise rotation and silence in key. The public acknowledgment using the Charette often elicits, "Wow, I can't believe it! I've not written a poem, Hiaku, song, or story since 3rd grade." The activity builds self-esteem and can be a foundation to base later team building or design work in learning environments.

Using Multiple Intelligences in Lesson Planning

In the formation of teachers lesson planning skills are important. There are many lesson planning models that incorporate Multiple Intelligences ("Multiple Intelligences Lesson Plans," 2012). The cognitive, affective, and interactive ("Blooms Taxonomy," 2012) educational objectives in lesson planning are amplified by use of learner Multiple Intelligences preferences. Articulating what educators seek to accomplish in lesson planning and our teaching using a MI lens is key. Multiple intelligences theory combined with great teacher formation (Mueller, 2008) allows each educator to accompany learners of all ages on their journey.

This activity has been introduced to over 200 Boise School District, Elementary Teacher Intern (ETI) students to provide a foundation for basic lesson planning using Multiple Intelligences. In subsequent lessons, interns work on writing lessons. In this teacher formation program, a two-sided, one-page, MI bubble lesson plan adapted from the *Multiple Intelligences Lesson Plan Book* by Anne Bruetsch (1995,1999) has been distributed and found helpful to ETI students. This lesson plan has broad application to all adult and youth educators and has been used with many Idaho and Montana educators. Paired with individual school district, program, and/or community mission, vision, and curriculums, MI is a great tool for every educator's tool box.

Andi Foley, ETI Instructor with the Boise School District notes, "This seminar truly takes high school students out of their comfort zone. They are so used to that expository type of learning, where they sit and listen and quite frankly don't have to do much, that when you ask them to share the posters, create with the play-dough and recite the poetry that they have written, it's truly exhausting for them--but they remember, and when they design their own lessons, more often than not they lean towards this inquiry style. They provide a brief introduction, but then they too focus on the process rather than the content. The content will come, but the process is most important."

The activities which engage the multiple intelligences are the means through which you fulfill your lesson objectives. "Intelligences That Plants Can Pass On" is an Imagination Activity. Even though the ability to formulate a mental image is a part of the visual-spatial intelligence, a separate imagination section in the Bruetsch lesson plan has been designed because it is such a valuable tool for learning. In addition, she suggests that Olfactory (Smell) /Gustatory (Taste) is important. Though neither the olfactory or gustatory senses are included as part of Gardners' nine

intelligences, Bruetsch includes it within the bodily-kinesthetic box because she believes that these two senses can assist the learning process even though they are rarely engaged for this purpose. Over the years working with plant science education tasting and smelling have become key triggers to learning, think about "eating berry pie" or "the smell of mint" to introduce an idea or concept.

Summary

In the end the most important idea is to start using Multiple Intelligences in your teaching. Asking the following questions may help you get started:

What intelligence best resonates with you?

What could you change to make this lesson work in your classroom?

How might you integrate MI into Career Pathways?

What intelligences are you teaching to? Your own, or your learners?

There is a great need for educators who can serve as guides, mentors, accompaniers and companions on the educational journey. Embracing the guide on the (inquiry) learner-centered side of the way of teaching enables you to try Multiple Intelligences; besides playing with play dough is fun!

References

Armstrong, T. (2000). *Multiple Intelligences in the classroom* (2nd Edition). ASCD, Alexandria, VA; http://www.thomasarmstrong.com/multiple_intelligences.htm

Bruetsch, Anne (1995,1999). *Multiple Intelligences lesson plan book*. Zepher Press, Tucson, AZ http://www.zephyrpress.com/

"Blooms Taxonomy." Retrieved from: http://www.edpsycinteractive.org/topics/cognition/bloom.html

"Charette Method of Elementary School Design/Education." Retrieved from: http://www.acitexas.com/files/Winter2008.pdf

"Charette: Adapting the Architectural Charette to Educational Strategic Planning." Retrieved from: http://www.nais.org/resources/article.cfm?ItemNumber=148110

"Charette: Landscape Architecture Guide." Retrieved from: http://www.gardenvisit.com/landscape/LIH/design_resources/community_planning.htm

"Charette: The National Charette Institute." Retrieved from: http://www.charretteinstitute.org/

Corona, V. (1989) *Children's ethnic crafts*. Earth Dance International Publishing.

Donovan, M., Bransford, J., & Pellegrino, J. (1999). *How people learn–Bridging research and practice*. National Research Council, National Academy Press, Washington, DC, Chapter 2.

Gardner, H., (1993). *Multiple Intelligences: The theory in practice*. Basic Books, New York, NY.

Gardner, H., (1999). *Intelligence reframed: Multiple Intelligences for the 21st Century*. Basic Books, New York, NY.

Keifer, J., &Kemple, M. (1998). *Digging deeper--Integrating youth gardens into schools and communities: a comprehensive guide*. American Community Gardening Association, Philadelphia, PA.

Kuntzler, B. (1998). "Kid Smart Poster Set," Retrieved from: http://www.amazon.com/

Laughlin, K. (2001). *The gift of Extension: Time, teaching and learning, and mentoring as components of Extension practice!* Doctoral Dissertation. University of Idaho: Moscow, Idaho.

Lazear, D., & Margulies, N. (1995). "Tap Your Multiple Intelligences Poster Set" Retrieved from: http://www.tower.com/tap-your-multiple-intelligences-poster-set-david-lazear-paperback/wapi/111893639

Lazear, D., (1998). *The rubrics way: Using MI to assess understanding*. Zephyr Press, Tucson, AZ

LeFebvre, J. (2008). "Play Dough: The Best Recipe for Fun and Learning, University of Wisconsin Extension." Retrieved from: http://parenting.uwex.edu/parenting-the-preschooler/documents/Play%20Dough.pdf

Mueller, F., (2008). *The formation of new teachers: A companion on the Lasallian journey*. Christian Brothers Conference Lasallain Monograph Series 2: Washington D.C.

"Multiple Intelligences Lesson Plans." Retrieved from: http://www.lessonplanet.com

Phelps, B. (1998). "About Teach/Learn Methods." Retrieved from: http://www.whitestag.org/resources/sb2a1.htm

"Play dough Recipe." Retrieved from: http://www.playdoughrecipe.com/traditional-playdough-recipe/

Richards, L., & Tyrl, R. (2005). *Dyes from American native plants.* Timberpress, Portland, OR.

Silver, H., Strong, R., & Perini, M. (2000). *So each may learn: Integrating learning styles & Multiple Intelligences.* ASCD Publications, Alexandria, VA.

Silver, H., Strong, R., & Perini, M. (2001). *The Multiple Intelligences indicator*. Thoughtful Education Press, LLC. http://www.silverstrong.com

"Teaching Strategies/Lesson Plans (California)." Retrieved from: http://www.csun.edu/~hcedu013/plans.html

"Teaching Strategies (Iowa)." Retrieved from: http://www.celt.iastate.edu/teaching/techniques.html

"Teaching Strategies (Hawaii)." Retrieved from: http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/teachtip.htm

Whittlesey, L., Seagraves, R., Welsh, D., & Hall, G. (1999). *Junior Master Gardener Teacher/Leader Guide, Level 1*. Texas Agricultural Extension Service, Texas A & M University, College Station, TX. Pass It On, pg 205. www.jmgkids.us

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