



Active Learning – Jigsaw

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June 26, 2017

Cite this resource: Tomaswick, L. (2017). *Active Learning – Jigsaw*. Kent State University Center for Teaching and Learning. Retrieved [today's date] from <http://www.kent.edu/ctl/educational-resources/active-learning-jigsaw/>

What

Jigsaw is a cooperative group activity in which students are interdependent to achieve a common goal. In part one, each group is provided a different prompt. The group members become experts on that prompt and create a group response. In part two, new groups are formed; comprised of students from different expert groups. Each student in the intermixed group is expected to teach the other group members their prompt-response from their previous group, “expert group”. The intermixed groups then complete a new task. The success of the group depends on each individual and therefore prompts engagement from individual students.



(Image Modified from: Yotam’s Courses Google Site, Activity #2 – Jigsaw, accessed Feb. 2017)

Introduction

Elliot Aronson and colleagues developed the Jigsaw technique, in the early 1970s, in order to reduce tensions and decrease competition in the classroom (APA, 2003). The strategy encourages students to actively listen, engage with others and prompt students to practice their communication skills, teamwork skills and critical thinking skills (Artut & Tarim, 2007; Perkins & Saris, 2001). Jigsaw has also been shown to improve student autonomy, learning gains and retention of the material encountered (Hanze & Berger, 2007; Perkins & Saris, 2001).

As with any group work technique, it can be difficult to engage all students or reign in a dominant student to allow others to participate. What is great about jigsaw is that it naturally diminishes both of those challenges while increasing individual and group accountability. Jigsaw also provides a mechanism for differentiated instruction; whether it be students needing conversations with others, more time or the ability to ask questions of the instructor. It also helps students who “got it” and mentally check out because they are expected to help their group members understand the material.

The keys to a successful Jigsaw session are **alignment** and **arrangement**. The prompts for the groups need to be **aligned** with successful group work properties; a challenging problem, one that requires multiple approaches, or one that benefits from diverse perspectives. **Arrangement** refers to the group arrangement; in large classes particularly, leaving it up to students to find others from different expert groups can become chaotic and take valuable class time. Arrangement can be self-selected, randomly assigned by the instructors or deliberately chosen based on abilities or interests.



Some studies suggest that the intermixed groups are alternated. This provides an ability for students to learn to work with a wider aware of their classmates.

Implementation

1. Describe Jigsaw to your students; why you are doing it (how it improves learning) and acknowledge that it may be out of a student's comfort zone to participate.
2. Divide your students into 3 or more groups of 3-5 students; the "expert groups"
 - a. These expert groups can be made of students who sit beside each other, randomly chosen or deliberately chosen based on abilities or interests.
3. Assign each group a prompt in which they will become experts on that prompt and agree on a response to that prompt. Note taking is usually suggested.
 - a. Typically, students are assigned different readings or videos to complete prior to coming to class, "All red expert group students' read ____, all green expert group students; read ____". They then need to come to the same understanding of that pre-class assignment prior to obtaining the related prompt.
Assessment possibility: Each student turns in their notes and/or completes self & peer evaluations related to contributions to group work (increases individual accountability)
4. Groups are intermixed, so that there are representatives from each expert group are present.
 - a. This intermixing can be facilitated by giving students numbers while in the expert groups. Upon rearrangement, you could have all 3s work together in the front right corner of the room; telling students who and where is key to making the rearrangement go more smoothly and quickly.
5. Experts teach their new group members their response; instructors should circulate to answer questions, guide groups thinking and to see if students need additional work if they completed early.
6. Groups complete a task and share their result.
 - a. Turned in or communicated with entire class
 - b. Type of task:
Alternative: A new prompt is provided to the new groups that requires the combination of their expertise to respond. You could also have groups present to the entire class. (increases group accountability)

Frequently Asked Questions

- a) *There are groups where one person is taking over, what can I do to help spread the work?* Select a leader for each group that will ensure each member is involved equitably; you could also allow the students to pick this leader as they will likely choose the someone who is not the dominant person to help control that dominant person (Note: allowing students to decide does take class time)
- b) *There is clearly a (or multiple) student who is collecting the profits of their group while not doing the work; what can I do?* It could be as simple as having students turn in their individual notes and those taken after conversing with their expert group. If this "profiting" is happening in the second group (jigsaw, study, mixed expert members), the solution may be in a peer-evaluation or reviewing the second group activity to ensure it is difficult enough it requires all member's



expertise. If you know the student did not prepare or is not doing their share, they can be removed from the group and put in a group where others did not prepare or were not contributing.

- c) *Is it appropriate for students to use their computers during this activity?* It depends on your question and your learning goals. If you would like your students to research a specific topic during class or product something online or done more professionally, you may want your students to have computers or their cell phones out. Otherwise, this technique can be as simple as having prompts on a screen, handed out at the beginning of the class or provided prior to class.
- d) *What are some easy ways to form groups?*
- You may want to assign students for both their expert and intermixed groups. This may save time and you could control who works with who. Groups can be formed by assigning numbers and letters to the class roster (A1, B1, C1, D1, A2, B2, C2, D2; A work in expert groups together, intermixed groups are all 1's together, etc.). A deck of cards can also be used; ex. expert groups are similar numbers while intermixed groups are suits.
 - Expert groups: The simplest way is to have the expert groups formed by having student work people right beside them. If there was a pre-class quiz or assignment, students could be grouped based on their responses (similar response groups or to ensure diversity of responses in groups).
 - Intermixed groups: In small classes, students can form groups to ensure a mixture of people from different expert groups (this could take time though). You could play a sort of musical chairs with students from expert groups; asking student with certain characteristics to move to certain tables ("person with 1st birthday in the year go ___" or "person whose first name starts with the earliest letter in the alphabet go ___"). You could also make intermixed groups more deliberately by reviewing majors, grades, career interests and other student characteristics.
- e) *How can I assess students if I use this strategy?*
- Pre-class work – this could be done online in Blackboard before class or at the beginning of class using paper, Blackboard or a student response system (a quick multiple choice quiz, short answer or have them turn in their notes). Assessing pre-class work helps incentivize students to complete the assigned work.
 - Individuals during class– students turn in a reflection of what they originally thought and then their thoughts after the expert group time. They can also turn in individual solutions to both the expert group and intermixed group tasks.
 - Groups – students have to present their product from intermixed group task to the class. Students could complete peer assessments regarding who contributed what to the prompt.
- f) *What different types of prompts work; how do I break it up for the different groups?* The first thing you will want to ensure is that the prompt aligns with your learning objectives for the day. The prompts can be the same for the intermixed groups and the prompts for the expert groups can be similar; see examples below.
- The expert group prompt may be a reading. Each group gets a reading (prior to or during class). They work in their expert groups to come to a similar understanding and



answer guided questions prior to going to the intermixed groups to learn about the other readings their peers read. The intermixed groups may need to synthesize similarities, differences or how all of the readings apply to some theory, concept or simply the learning objective for the day.

- b. The expert groups can take on roles of different stake holders. They then have to solve a problem in the intermixed group while considering each stake holder.
 - c. The expert groups may learn about a certain characteristics about a topic. The intermixed groups then have a problem to solve in which they need all of the information from each expert group to make an educated solution.
 - i. Expert group: location details - demographics, natural resources, land and water forms, imports and export and politics. Intermixed group: solve a problem related to that location (building, business, environmental, or politically based problem)
 - ii. Expert group: Businesses details - employees, benefits, revenue. Intermixed group: develop a business plan to improve the company.
 - iii. Expert group: boost sales in print, social media, in-person, TV-2. Intermixed groups and develop a plan using all 4+ methods to boost sales
 - iv. Expert group: different details about a patient/student. Intermixed groups: develop a treatment plan or plan to help student.
 - v. Expert group: specific part of a cell. Intermixed group: describe how they work together and/or solve a problem related to a function of the cell.
 - vi. Expert groups: mean, median, mode range. Intermixed group – teach each other how to find the ___ or use a program to find the ___ then solve a problem where they need to find all of the expert piece prompts.
 - vii. Expert groups: ionic bonding, covalent bonding, hydrogen and van der Waals, and basic concepts about bonds. Intermixed groups: teaching each other, develop key points (comparisons) and take a test related to chemical bonds.
- g) *I have a large number of students, who would this work in a large class?* You can have groups working on the same prompts. When they go to their intermixed groups, advise them who to work with and where to ensure a quick change from expert to intermixed groups.

Other Resources

Jigsaw.org

<https://www.jigsaw.org/>

46 different jigsaw activities (geoscience, environmental science, biology, geography and language); using images, maps, hand samples, thin section, for analyzing data sets, in the field & in reading literature.

<http://serc.carleton.edu/sp/library/jigsaws/activities.html>

Socio-environmental case studies

<http://www.sesync.org/for-you/educator/case-study-collection>

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National Center for Case Study Teaching Science. You can search this site based on subject, educational level and type/methods among other characteristics. The case can be used by the groups.

<http://sciencecases.lib.buffalo.edu/cs/collection/>

Tips for implementing group work in the classroom

<https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/alternatives-lecturing/group-work/implementing-group-work-classroom>

4 Things You Don't Know About the Jigsaw Method.

<https://www.cultofpedagogy.com/jigsaw-teaching-strategy/>

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