

08 Active learning strategy

ACTIVE LEARNING STRATEGY 08

Jigsaw

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THE STRATEGY:

JIGSAW TEAMWORK

Cooperative learning is an instruction method that encourages small groups to work together to maximise the collective learning of the group (Johnstone et al., 2008). The 'Jigsaw Method' is one form of a cooperative learning strategy and is designed to facilitate individual and group learning activities in education. The strategy requires that the learning is initially shared among the group and provides everyone in the class with an understanding of the entire topic or concept. For the activity, the class is divided into small 'Jigsaw' groups. The main topic is divided into several sub-topics which are then assigned to students within each

group. Individual students must research their assigned sub-topic before joining up in expert groups with students who have been assigned the same sub-topic. The expert group allows students an opportunity to share and learn from one another and clarify any misconceptions garnered during the individual research stage.

The original Jigsaw groups are then reformed with an 'expert' from each sub-topic. Experts take it in turn to teach the group about each sub-topic, allowing the group an opportunity to piece together the parts of the 'puzzle' that contribute to the overall understanding of the main topic.

LEARNING THEORY UNDERPINNING THE STRATEGY

Jigsaw learning activities were introduced by Elliot Aronson in 1971, originally with the objective of addressing racial tensions and improving learner engagement in schools (Aronson, 2018). The strategy, like many others that incorporate group work, is supported by Russian psychologist Lev Vygotsky's social development theory. Vygotsky determined that a learner's development improved 'through problem solving under adult guidance or in collaboration with more

capable peers' (Vygotsky, 1978, p. 86).

However, Jigsaw activities are relatively complex and may be more suited to students that are familiarised with group work (Clarke, 1994). Learning in groups is subject to a range of complex elements including individual characteristics, group dynamics and interaction theory (Jacques & Salmon, 2000). Clarke suggests that less confident learners may be paired within groups to help them overcome their anxieties.

RESOURCES

Room setup to accommodate group breakout (any room with flexible seating arrangements or clear floor space can be utilised) Pen and paper (for student/group notes)
Projector and screen or whiteboard to introduce the activity
Flipchart, paper and markers for group reporting
Assessment/Feedback/Quiz

WHAT YOU CAN DO TOMORROW

You can use this shortened and simplified version of Jigsaw as part of any lesson to gradually introduce students to the strategy:

1. With thirty minutes remaining in a lesson, take any topic that you have just covered during class and divide it into 3-4 sub-topics (for speed, decide on your topic/sub-topics ahead of class).
2. Divide the class into small (Jigsaw) groups whereby the number of students in each group matches the number of sub-topics.
3. Allocate a different sub-topic to each member in the group and allow 5 minutes to individually write down 2-3 bullet points they believe capture the main attributes of the group
4. Reform the groups as 'Experts' allowing 10 minutes to share, confer and agree on a single list of 2-3 bullet points covering the sub-topic.
5. Collect the completed lists from the expert groups and use the information to summarise the lesson while also affording an opportunity to clarify any remaining misconceptions.
6. Explain that you intend to use an expanded version of the activity in future lessons and emphasise the benefits of this approach such as:
 - a. Facilitating more active student participation
 - b. Opportunity for deeper individual understanding
 - c. Foster teamwork and an opportunity to learn and help each other.

STEPS FOR IMPLEMENTATION

In preparation for this activity, the tutor should select a main topic in advance and divide it into several sub-topics which will be assigned to students. The number of sub-topics will determine the size of each 'Jigsaw group' by allowing one learner per sub-topic. The following steps will help you with the structure and sequencing of the activity.

STEP 02

Within each of the Jigsaw groups, assign a sub-topic to each student. You should now have several Jigsaw groups with each member taking responsibility for researching one of the sub-topics (Figure 1).

STEP 04

Expert groups should then be formed consisting of students nominated to research each sub-topic. The expert groups are allotted sufficient time to discuss their understanding of the sub-topic and prepare material/information to present to their own Jigsaw group. This group discussion usually results in a deeper understanding of the sub-topic through peer learning (figure 2 denotes 3 Expert groups covering 3 sub-topics).

STEP 06

It is a great idea to close the activity with a team quiz or task. This allows the learners to test their knowledge and incentivises participation by introducing an element of competitiveness between the teams. As with all learning activities, it is good practice to finish with a debriefing exercise whereby learners have an opportunity to provide feedback and suggestions for future improvements.



Divide the students into Jigsaw groups of 3 – 6 learners. It is preferable to have the groups as diverse as possible with mixed genders, ethnicities and levels of ability. This promotes greater levels of learner integration and reduces the possibility of cliques or weaker learning groups.

Students are provided learning material for individual sub-topics and a fixed period of time allocated to researching in preparation for expert group collaboration and discussion.

Students return to their original Jigsaw groups where each expert in turn presents what they have learned to the other Jigsaw group members (Figure 3). It is important to encourage questions and group discussion at this stage while also ensuring that all group members are engaging.

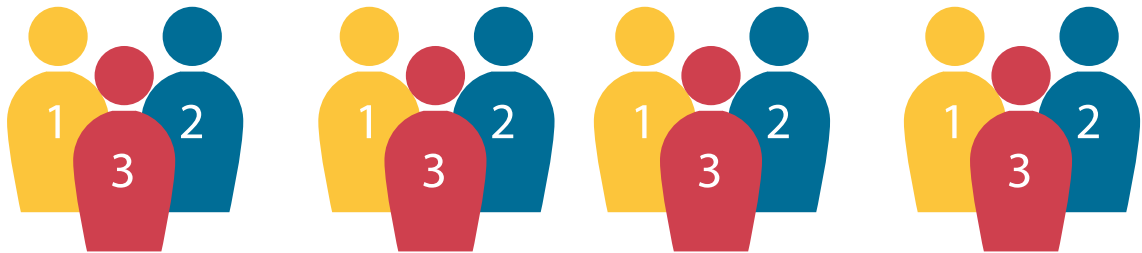


Figure 1: Jigsaw groups – 4 groups allocated 3 sub-topics

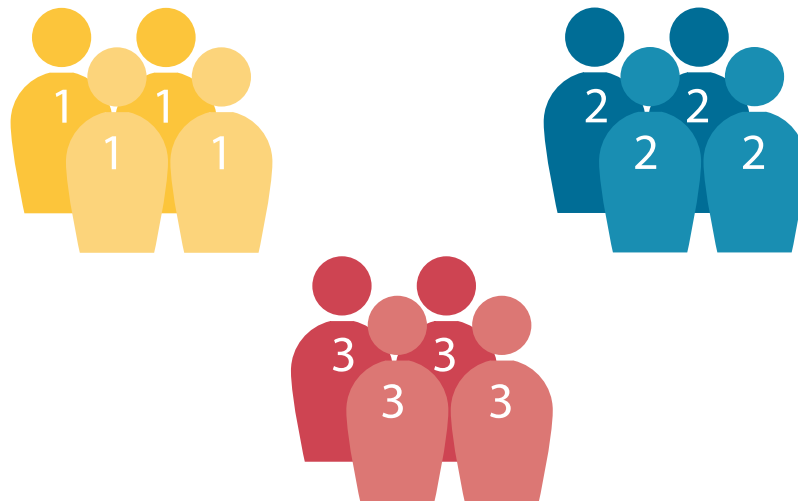


Figure 2: Expert groups discussing 3 different sub-topics



Figure 3: Expert presentation in Jigsaw group

OVERCOMING PUSHBACKS

Group learning is subject to a myriad of problems that can reduce the effectiveness of learning activities. The following examples highlight issues that may arise during a Jigsaw learning activity:

1. THE DOMINANT LEARNER

There is always the possibility that dominant personalities will try to take over the activity, to the detriment of other learners. It is your responsibility as facilitator to supervise the activity and ensure that all learners have equal opportunity to contribute. Fortunately, the nature of this activity requires that each learner present material and usually groups recognise the value of individual contributions.

2. THE BORED LEARNER

While boredom is a common problem in education and training, active learning is only effective if a learner engages. Sometimes stronger students can become bored with group work if they perceive that they are above the level of learning. In the case of Jigsaw learning, this may be overcome by emphasising for these students the challenge of becoming 'teachers' for their peers. The

use of team quizzes or tasks can also be a motivational factor for competitive students.

3. THE QUIET LEARNER

Learning groups usually include quieter, shyer participants who are often reticent in coming forward with contributions. The very nature of Jigsaw learning is helpful with this, as there are individual as well as group tasks. Often, the quieter learners will struggle most with having to present in front of their peers. You should actively supervise group work to ensure that other students are not talking over or disrupting another individual's presentation.

4. THE SLOW LEARNER

In any learning group, there will typically be different levels of learners. Jigsaw activities offer very strong opportunities for peer learning. However, it is crucial that you monitor the activity closely, particularly during the Expert group discussions. It is important to ensure that slower learners are taking on board feedback and suggestions from the other 'Experts' in their group..

CASE STUDY

OVERVIEW

This Jigsaw activity was run with a group of Year 3 Horticulture degree students studying a module on project management. It is worth noting that this group was in the advanced stages of group development (see chapter on group work) and had previous experience with group learning activities.

The main topic of this lesson was 'The Role of the Project Manager'. This 2-hour lesson was conducted with a group of 11 students. The classroom had a traditional lecture theatre layout, with tiered/fixed seating. This provided clear floor space and whiteboard/wall space for students to work in groups and present their findings.

A flipped classroom approach (Bergmann and Sams, 2014) was adopted for the lesson whereby students were provided with course materials for the topic prior to the lesson via the Institute's VLE. The materials included videos and worksheets which students had to watch and complete prior to the classroom workshop.

At the beginning of the session the students were given a 5-minute briefing describing how the session would be conducted and also outlining three sub-topics that were to be explored throughout the activity.

THE ACTIVITY

Students were divided into Jigsaw groups and allocated a number to correspond with a sub-topic. With an odd number of students (11), the groups were arranged to ensure each group would have at least one expert for each of the sub-topics (Figure 4).

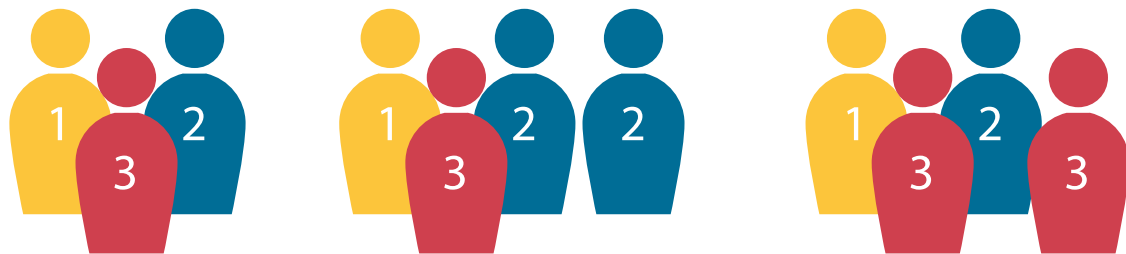


Figure 4: Jigsaw groups based on class group of 11 students

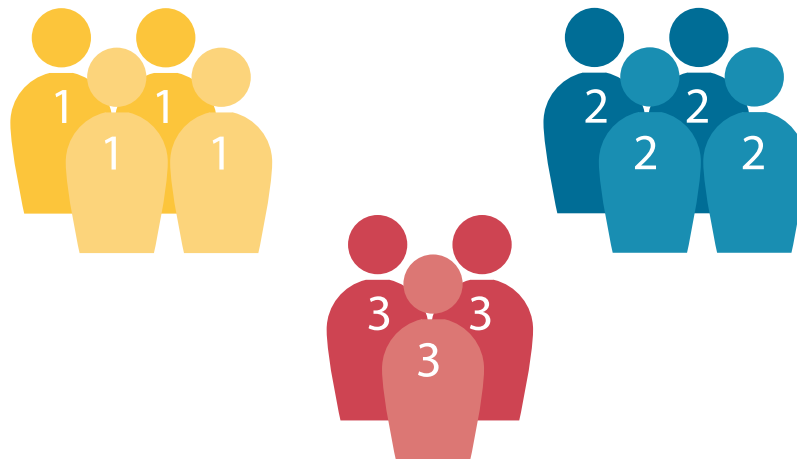


Figure 5: Expert groups based on class group of 11 students

INDIVIDUAL RESEARCH

30 minutes were allocated for students to individually research their allocated sub-topic using their pre-completed worksheets and pre-lesson material as a useful reference point. Although this section of the activity was conducted in relative silence, some peer-to-peer discussion could be heard and was not discouraged.

Having completed their individual research, expert groups were formed grouping all identical sub-topic researchers together (Figure 5).

EXPERT GROUP

Expert groups were instructed to work together for 40 minutes and tasked with producing a common A3 poster. The poster would be used to present the information to the other members of the Jigsaw group and should illustrate the outcomes of their combined research related to their specific sub-topic. At this stage the activity became more dynamic, with healthy discussion among the 'experts' as they came to a common agreement on the content of their posters (Image 1).

The tutor fulfils a facilitator role during this part of the activity, dividing time between the different groups to provide guidance and encouragement. This allows the tutor the opportunity to ensure that information on posters is accurate and that everyone is contributing to the activity.

JIGSAW GROUPS

Students were invited to return to their original Jigsaw groups and display their posters on a wall space (Image 2). Each 'expert' was allowed ten minutes to present the information from their individual sub-topic to their group. Where there were two experts in a group, the presentation duties were shared.

TEAM QUIZ

The activity was concluded with a 10-minute team MCQ test which captured aspects of all the sub-topics covered in the lesson. This was an excellent way for the tutor to gauge whether the learning outcomes of the lesson had been met and provide an opportunity for students to clarify any outstanding misconceptions. The students were motivated by the competitive element of the task, i.e. wanting to have the most correct answers in the team quiz.

STUDENT FEEDBACK

The students were invited to reflect on the activity at the end of the session and provide feedback to compare it with a previous group activity where whole-group presentations were required. The following were the main points of feedback:

Everyone had something to do.

Collaboration was strong in the Expert groups as consistency in the poster information was required.

More involvement from the tutor to guide and explain would be welcome. The activity was more intimate than larger group activities.

There was a good 'buzz' in the room. It was easier and less formal to present to a small number of peers rather than a large group.



Image 1: Expert groups working on the design of a common poster



Image 2: Students in their Jigsaw group with 'Expert' presenting

TOP TIPS FOR PRACTITIONERS

The following may be helpful if you are trying this strategy for the first time:

1. This is a relatively complex cooperative learning activity (with transitions between Jigsaw and Expert groups) so it may be more appropriate to use with students that are already comfortable with group learning strategies.
2. Try a simplified/abridged activity to see how your learners react and to get more comfortable with the format yourself.
3. Be observant and stay involved. While the students may appear to be active and engaged, it is important that you monitor their progress and provide explanations and encouragement when appropriate.
4. Informing the students that there will be an MCQ at the end of the session, keeps them motivated and focused, ensuring that they fully understand each of the expert presentations.
5. Do not be restricted by the teaching space available. While a flexible classroom layout is desirable, any clear floor and wall space can be utilised to accommodate this strategy.
6. Do not be afraid to mix it up. Jigsaw activities do not need to be standalone, they can be integrated with your existing teaching approaches, e.g. flipped learning can be used to prepare for the activity outside of class time.

FURTHER READING

Aronson, E. (2018). The Jigsaw Classroom. Social Phycology Network. Retrieved June 2, 2018 from <https://www.jigsaw.org/>

Clarke, J. (1994). "Pieces of the puzzle: The jigsaw method" In Sharan, S. (Ed.), Handbook of cooperative learning methods. Greenwood Press.

TEMPLATE

Course		
Module		
Topic		
Lesson	No:	
Directions	<ol style="list-style-type: none"> 1. One member from each jigsaw group will join an expert group. 2. Each expert group must research, discuss and create an individual poster (identical content on all posters) based on the corresponding topic outlined in the table below. 3. Each expert group member will then present their findings to their original jigsaw group. 	
Jigsaw Group 1	Jigsaw Group 2	Jigsaw Group 3
1 2 3	1 2 3	1 2 3
Expert Group 1	Expert Group 2	Expert Group 3
<p>Subtopic 1 e.g. describe, discuss, outline, identify, explain etc</p> <p>1 1 1</p>	<p>Subtopic 2 e.g. list the sequence required, using examples present 5 reasons for, categorise or summarise.</p> <p>2 2 2</p>	<p>Subtopic 3 e.g. draw a diagram showing, calculate, review.</p> <p>3 3 3</p>
Jigsaw Group 1	Jigsaw Group 2	Jigsaw Group 3
1 2 3	1 2 3	1 2 3

MCQ Template: <https://templates.office.com/en-us/Multiple-choice-test-or-survey-3-answer-TM02808005>