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Colour coding to facilitate learning in a Jigsaw Classroom – sharing our experiences

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ABSTRACT

The Medical Council of India has mandated that two-thirds of the teaching schedules must comprise of interactive teaching sessions. Introduced by Elliot Aronson in 1971 in Texas, USA, 'Jigsaw' is an interactive and a cooperative, peer-assisted learning technique. The authors conducted Jigsaw classrooms in 3 different settings and utilized an innovative colour coding technique using coloured stickers. The colour coding helped in the seamless and noiseless movement of the participants from the home group to expert groups thereby ensuring a smooth transition from one step of the Jigsaw to the next. The various steps were able to start without any delay due either to any confusion about which group to join or the time wasted in asking the facilitators or other delegates for directions. The colour coding was especially helpful in the conduct of the final step when students must discuss the given sub-topics in the correct sequence. Despite extensive searching, the authors were unable to find any other instance of utilizing colour coding in a Jigsaw classroom. Based on the positive feedback and the advantages of colour coding, the authors feel that it can be replicated in Jigsaw classrooms across the world for better coordination among the students, saving time in transitioning from one step to the next and ensuring that the discussion sticks to the intended sequence.

1. Respected Editor

The Medical Council of India has introduced the new Competency Based Medical Education (CBME) curriculum for undergraduate medical education from August 2019 onwards. Under the new guidelines, it is mandated that two-thirds of the teaching schedules must comprise of interactive teaching sessions with traditional didactic lectures being limited to not more than one-third of the schedules.[1]

Introduced by Elliot Aronson in 1971 in Texas, USA, 'Jigsaw' is an interactive and a cooperative, peer-assisted learning technique. The initial purpose of a Jigsaw classroom was to integrate students from different racial backgrounds in the desegregated schools of Austin, USA. As we all know, the contribution of every piece of a jigsaw puzzle is equally important and even a single missing piece means an incomplete picture. Similarly, the contribution of every student is equally important in the jigsaw classroom making it a truly democratic teaching learning technique.[2]

Cooperative learning has been defined as a "set of methods in which students work together in small groups and help one another to achieve learning objectives"[3] and cooperation is the key to the success of the Jigsaw technique. In a Jigsaw classroom, the learners start from 'home groups', then move to 'expert' groups and again return to their 'home groups'. As the learners move from

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Step 1 to Step 2 and Step 3, they not only learn from one another but also get a chance to share knowledge with their peers. Knowledge is divided into smaller pictures and the knowledge of all students combines to form the big picture in the last step of the Jigsaw. A Jigsaw classroom inculcates the spirit of cooperative peer-assisted learning in the students enabling them to achieve better learning skills and thereby changing the role of the teacher from being the 'sage on the stage' to a facilitator or a 'guide on the side'.[4]

Contrary to popular perception that the interactive teaching methods require additional faculty and resources, the Jigsaw technique can be well conducted even in the setting of colleges/departments with limited faculty strength and without any additional burden on the existing resources.[5] There is a lot of interest in the Jigsaw technique, however the lack of training is one of the main reasons why faculty are not implementing it in large numbers.

Towards this end, the medical education unit of our college organized a 1-day CME on Small Group Teaching Methodologies in November 2019. The CME consisted of 5 hands-on training workshops to train and better equip the delegates with regards to implementing the selected small group teaching methodologies after returning to their respective institutions. One of the sessions was dedicated to the hands-on training in the Jigsaw technique. The session received appreciation from the delegates and the guest speakers for its excellent seating arrangements and meticulous planning and conduct.

The workshop started with a 10-minute presentation in which the technique and its steps of the Jigsaw were defined and variations to the traditional method were discussed. Delegates were then divided into 2 groups of 35 each. Each group was asked to proceed to a designated room which was already pre-arranged with 35 chairs in 7 groups, Group 1 to Group 7 (5 chairs per group, each group arranged in a small circle), with each chair carrying a different colour sticker. There were 5 different colours of the stickers in each group (red, yellow, green, purple and orange) and in every group a particular colour was represented only once. e.g in Group 1 – one chair had a red colour sticker, the next chair had a yellow colour sticker, the third chair had a green colour sticker, the fourth chair had a purple colour sticker and the last chair had an orange colour sticker, and similarly in all 7 groups of both the rooms. The delegates were randomly allocated seats and they were asked to stick the colour sticker on their shoulder/shirt pocket/sleeve/back of hand (as per convenience) so that the colour was easily visible to everyone. The topic for discussion, in this case Iron deficiency anaemia had already been subdivided into 5 sub-topics by the facilitators and printed notes had been prepared beforehand. Interestingly, the printed notes were also colour coded with the same 5 colours as explained subsequently. All the handouts of sub-topic 1, 'introduction', had a small red colour sticker on top of the pages, all the handouts of subtopic 2, 'etiology', had a yellow sticker on top of the pages, all the handouts of sub-topic 3, 'pathogenesis', had a green sticker on top of the pages, all the handouts of sub-topic 4, 'diagnosis', had a purple sticker on top of the pages and all the handouts of sub-topic 5, 'management', had an orange sticker on top of the pages. 1 sheet from each subtopic and representing every colour (total 5 sheets, each sheet carrying a different colour) was kept in the centre of each of the 7 groups in both the rooms. The participants of each group were asked to pick the colour coded sheet that matched the colour of their sticker and begin reading the given material as part of Step 1 of the Jigsaw.

In the next step of 'expert groups' the participants were instructed to gather at the 5 colour coded areas of the room as per the colour of their stickers and their handouts, e.g. all reds met in one area, all yellows in a different area, all greens in a another area and so on. These areas had been pre-designated by a large board which was covered in coloured paper. Thus, all the 5 different expert group areas (the four corners of the room and the centre of the room) were designated by one of the 5 colours namely, red, yellow, green, purple and orange. The colour coding helped in the seamless and noiseless movement of the participants from the home group to expert groups. The next step was able to start without any delay due either to any confusion about which group to join or the time wasted in asking the facilitators or other delegates for directions.

In the final step of the jigsaw, the participants returned to the original home groups. After taking inputs from and discussing with their peers of the colour coded expert groups the participants were now asked to discuss and share the knowledge of their individual sub-topic. The colour coding came in handy once again as explained subsequently. The discussion in this step had to move sequentially starting from the sub-topic 'introduction', moving to 'etiology', then to 'pathogenesis', then to 'diagnosis' and finally to 'management'. To make this easier for the delegates to understand a PowerPoint slide was displayed on the screen in front of the room, with the colours arranged sequentially linearly (top to bottom, red-yellow-green-purple-orange) with the time limit (10 minutes) written in front of each colour. The facilitators explained that in every group the member with the red sticker and red colour coded handout had to start discussing his/her topic first and one by one all the group members had to follow as per the colour coded sequence displayed on the screen. A bell was rung and the participants who were from the red colour-coded sub-topic started discussing the 'introduction' to Iron deficiency anaemia in their respective home groups. At the end of every 10 minutes a bell was rung by the instructors and the participants moved sequentially from one colour-code to the next finishing with the sub-topic on 'management' of iron deficiency anaemia which was colour coded orange.

At the end of the CME, an online feedback form was administered to the participants. The feedback form consisted of both closed ended and open-ended questions with the latter being included in the form to gather feedback, both positive and negative regarding the experience of the participants and their perception of each workshop. In the section dedicated to the Jigsaw technique workshop, a total of 47 delegates gave their feedback. While a direct question regarding the colour coding was not asked to avoid any bias, when asked that in their opinion what was the best part of the workshop, many participants praised the system of colour coding as an innovative addition to the traditional Jigsaw classroom. Some of the responses received are presented verbatim below –

1. "Seating plan and colour stickers."
2. "The colour coding was extremely helpful."
3. "Use of colour coding was the best part of the workshop."
4. "Well organized, card number and color coding of home group and experts."
5. "Colour coding is a great idea."
6. "Colour stickers made it easy to look for our colour partners."

Apart from the formal feedback gathered by the feedback form, many delegates gave positive informal feedback about the colour coding. Many delegates even wanted to know the costs involved in organizing and printing the stickers. They were pleasantly surprised to hear about the low cost of printing/procuring these stickers and some of them even wanted to implement the colour coding in Jigsaw sessions at their colleges/institutes in the very near future.

The principal author of this article was invited as a guest speaker at a faculty development workshop at another medical college in New Delhi to deliver a guest lecture and conduct a workshop on the Jigsaw technique. The author was specifically requested to arrange for the colour stickers for the workshop and the idea of colour coding received great reviews from the participants and organizers of the said workshop. Similar to the CME, many participants of this workshop wanted to know the costs involved in procuring the stickers and were enthusiastic about implementing the Jigsaw technique along with the colour coding in their respective departments.

Recently the department of Anatomy at our institution implemented an interactive teaching learning session using the Jigsaw technique for Phase-1 MBBS students. The topic under discussion was – embryological development of the Heart. The topic was similarly divided into 5 smaller sub-topics and the same colour coding as the CME was followed. The session was attended by all 100 students of Phase-1 MBBS and the session was conducted in 2 separate rooms with each room pre-arranged for a Jigsaw classroom of 50 students.

Before occupying their designated seats, the students were asked to stick the colour stickers already present on the chairs, on their apron collars/pockets and to pick the corresponding colour coded handout from the 5 printed handouts already kept in each group. The facilitators began the session by explaining the steps of the Jigsaw to the students and after this the Jigsaw went through the 3 steps of home group-expert group-home group. Colour coded zones had been pre-designated in both the rooms for the 'expert group' discussions.

The colour coding was very helpful in ensuring a smooth transition from one step to the next and in the conduct of the final step when students must discuss the given sub-topics in the correct sequence. The point about seamless and noiseless transfer of participants was even more evident here because these were classrooms of 50 students each and during group work it is common to see students getting off task and the discussion getting derailed.[6] The classroom could have quickly descended into chaos if there was even a hint of confusion or misunderstanding of instructions among the students.

At the end of the session, an online feedback form was administered to the participants. Similar to the feedback form of the CME, this feedback form also consisted of both closed ended and open-ended questions with the latter being included in the form to gather feedback, both positive and negative regarding the experience of the participants and their perception of each workshop. A total of 77 delegates gave their feedback. While a direct question regarding the colour coding was not asked to avoid any bias, when asked that in their opinion what was the best part of the workshop, many students praised the system of colour coding. Some of the responses received are presented verbatim below –

1. "Discussion of the same colour group."
2. "Different colours given to each person."
3. "Colour coding made it easy to find the expert group."
4. "the colour stickers."
5. "Colour coding was an interesting idea."

Despite extensive searching, the authors were unable to find any other instance of utilizing colour coding in a Jigsaw classroom. The only document that mentions something similar to colour coding is a Guide document on Jigsaw as a collaborative learning activity, published by the University of Newcastle, Australia which advises the use of pieces of coloured paper for random grouping of students in a Jigsaw classroom.[7] Based on the positive feedback from three separate instances and based on the advantages of colour coding, the authors feel that it can be replicated in Jigsaw classrooms across the world for better coordination among the students, saving time in transitioning from one step to the next and ensuring that the discussion sticks to the intended sequence.

Thank You

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3. Conflict of Interest

Nil.

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