Applying the Frayer model in the jigsaw classroom

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Abstract
Purpose: The paper examines ways of building small groups, the advantages, and the difficulties of group-work in the classroom, as well as the necessary elements of cooperative learning processes. Furthermore, it examines the possibility of implementing the Frayer model in the jigsaw classroom. ***Methods:*** The paper combines a brief literature review on group-work, collaborative learning, the Jigsaw Classroom, and the Frayer Model and presents examples from classroom practices using a combination of the Jigsaw Classroom with the Frayer Model in Greek schools. ***Results:*** Key findings support the argument for implementing the Frayer model in the jigsaw classroom for teaching a foreign language and other learning subjects, both in Primary and Secondary education. ***Implications:*** Instructional practices which combine the Frayer Model and the Jigsaw Classroom can contribute to the reinforcement of grammatical, lexical, syntactical, and mathematical learning in diverse Primary and Secondary School classrooms.

Keywords: differentiated instruction, heterogeneity, jigsaw classroom, Frayer model, collaborative activities.

JEL Classification: *I20*

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1 INTRODUCTION

Teaching in mixed ability classrooms is a daily routine for foreign language teachers. In the effort made to meet this demanding task, there are new methods and suggestions in the field of teaching methodology, which are extremely useful and effective, and many are based on the basic principles of differentiated instruction. The application of these methods increases the learners' active participation in the learning process, improves performance and adapts the lesson to their interests and needs. In recent years there has been an increasing tendency for the implementation of collaborative activities in the foreign language lesson, a fact that greatly increases the motivation and the positive attitude of the learners towards the foreign language lesson. In this article we will refer to the combination of two methodological tools in teaching practice: the jigsaw classroom and the Frayer model (Tsakalidou, 2020, 2021a, 2021b).

2 BACKGROUND

1. Types of group-work and grouping criteria
There are many types of team-based learning activities, as well as different ways and criteria to create groups. Some ways of creating small groups are the following:
(a) Small groups based on learning readiness, as a form of internal differentiation, so that the teacher can help every individual learner according to his/her learning needs.
(b) Working in small groups based on work topics, learners' interests, different abilities and gender, which contributes to the promotion of productive learning.
(c) Working in small groups to carry out a project.
(d) Working in groups with flexible work objectives and depending on the desired end product.
(e) Working in fixed groups according to the learners' seating.
(f) Working in random groups.
(g) Free-choice groups, where learners choose their partners on their own and the teacher only determines the number of people in each group.
(h) Jigsaw classroom, which we will examine in detail below (Karagiannidou, 2007; Tsakalidou, 2020, 2021a, 2021b).

2. Benefits of group-work

© 2021 Authors. Published by International Hellenic University
ISSN: 2654-0274. UDC: 658.8+338.48+339.1+640(05)
http://doi.org/10.5281/zenodo.7508230
Published online: 1 June 2021
www.jcetr.gr

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According to Karagiannidou (2007) working in groups offers multiple benefits in foreign language learning, as:
(a) it promotes social learning and the use of language;
(b) the teacher gives up his/her dominant role and therefore the learners are more willing and ready to act linguistically;
(c) the immediate correction of errors and stress is reduced;
(d) all learners act responsibly, as everyone is co-responsible for the success and outcome of the joint work;
(e) it improves the classroom climate and team dynamics;
(f) learners learn from each other,
(g) the corrections are not made exclusively by the teacher, as there is self-correction and peer-correction.

3. Difficulties of group-work

Some difficulties of working in groups are:
(a) the learners use their first language instead of the foreign language in many cases;
(b) in some cases, there is no discipline,
(c) some learners may have difficulty working with noise;
(d) others may dominate in their team and create problems during their cooperation;
(e) some learners may not be actively involved and may let other members of the group complete the work on their own;
(f) control may be lost, e.g., some may be chatting instead of working,
(g) and learners make mistakes in the foreign language, which cannot be corrected by the teacher (Karagiannidou, 2007).

4. Effective collaborative learning

In order for learners to be actively and effectively involved in collaborative learning, five elements, known by the acronym PIGS FACE, are essential (cf. Figure 1).

Figure 1 - Pig's FACE

In specific:
(a) *positive interdependence* means that in collaborative learning situations learners need to work together as a cohesive team in order to achieve common learning goals.
(b) *individual accountability* means that learners ask for help, present their ideas, make the greatest possible effort, help the group function well and take care of each other.
(c) *group processing* is defined as a depiction of group-work aimed at helping learners.
(d) *social skills* are the fourth essential element of collaborative learning. Learners should be divided so that they work effectively and the teachers makes sure they have been taught the basic learning skills of collaborative interaction, such as attentive listening, collaboration, and negotiation.
(e) *face-to-face promotive interaction*, which promotes the productivity and achievements of each group-member. The learners who make up the group encourage and facilitate the efforts of others with the ultimate goal being to achieve the group's goals (Jensen, Moore, & Hatch, 2002; Johnson, 2009; Johnson & Johnson, 2008; Johnson, Johnson, & Houlubec, 1994; Killen, 2007; Slavin, 2011; Yager, 2000).

5. Jigsaw classroom

Jigsaw classroom is a method, where each learner is equally necessary in his group in order to create a complete picture (just like the pieces of a puzzle). It is a strategy that allows each group to examine an aspect of a specific subject, concept or unit in depth. Learners work in complete interdependence to complete a project or solve a problem. Therefore, everyone teaches and is taught by others, while they must pay attention at all times, since in the end all learners will be examined in all aspects of the subject they are working on (Tsakalidou, 2021a).
The procedure followed can be seen in Figure 2:
(a) Learners are divided into small groups of four or more members, in which each learner undertakes a specific work-related topic (jigsaw groups).
(b) Each learner works independently (possibly at home, if there is a lack of time in the classroom), collects and notes down the necessary information.

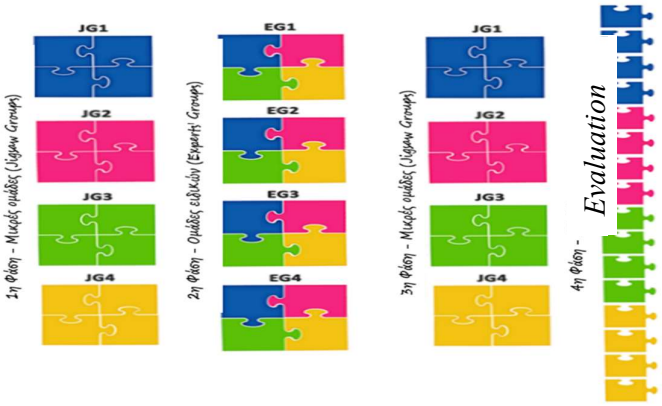

Figure 2 – Jigsaw classroom

(c) Expert groups are formed, consisting of individuals from each group who have a common subject, evaluate the information they have found and prepare a brief report on their topic.
(d) They then return to their original groups (jigsaw groups), to inform them, as experts on the subject. Each member of the team does the same and thus composes the overall picture of the project.
(e) At the end of the process, the work as a whole is evaluated in the classroom.

6. Frayer model

The Frayer model is a graphic organizer and its purpose is to analyze and define words and concepts. It allows children to describe a word in four different ways. Usually, it includes the following four boxes that surround the central key-word/concept/idea, as shown in Figure 3 (Frayer, Frederick & Klausmeier, 1969; Tsakalidou, 2021b).

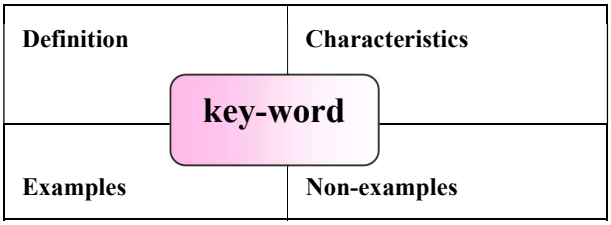

Figure 3 – Frayer model

Definition: Here the learner defines the central word. A visual representation of the definition or interpretation may also be requested in combination.

Characteristics: It is a way of expanding the definition. Here learners can write and present various features of the key-word based on the definition they have given.

Examples: In this field learners demonstrate their understanding of the word or concept by giving examples.

Non-examples: Sometimes it can be helpful for learners not only to know what a concept is, but also what it is not. Non-examples can make the definition more specific.

7. Combination of the two methodological tools

In order to implement the Frayer model in the jigsaw classroom the following procedure is followed (Tsakalidou, 2021b):

1. First of all, the teacher divides the learners into jigsaw groups based on the criteria he/she will choose, depending on the respective learning goal he/she has set.
2. Next, he/she designates the experts for each subject (e.g., learners who will work on the definition, the characteristics, examples or non-examples).
3. The learners are divided into four groups of experts and each group will start working with a specific section of the Frayer model (definition, characteristics, examples, non-examples).
4. Each group of experts is given the cards with the concepts/key-words that will be processed (the number of cards may differ).
5. The experts process the cards given to them in collaboration with the rest of their group, in order to note down the most important information about the section assigned to them.
6. In the next phase, and after the experts' teams have completed their work, they return to the jigsaw groups and complete the Frayer model for the 10 words given to them.
7. In conclusion, all the groups present the results of their work to the other groups and discuss together. The presentation can be done in different ways depending on the learners' interests. For example, with a hand-written poster, a Power Point presentation, a digital poster, etc.

8. Application examples in Primary Education

Moreover, we are going to examine two application examples in Primary Education. In the first example, which is suitable for Kindergarten and Primary School (Figure 4), learners work with shapes (triangle, square, rectangle, circle, pentagon, rhombus). In the first completed Frayer model we see the triangle. In the definition, the learners can draw the shape of a triangle or write the word "triangle". In the characteristics' field the learners can write "3 angles, 3 sides". In the example field, the learners can draw different types of triangles (equilateral, isosceles, scalene). In elementary school, they can additionally write a caption below each type of triangle. Finally, in the non-examples, learners can draw various other shapes, that are not triangles (e.g., circles, squares, etc.).

Every expert undertakes a field of the model for all shapes and works in the corresponding team of experts. When he/she returns to his/her original team (jigsaw group), like the rest of the team, they combine the information noted in the experts' teams and complete the Frayer model for each shape together.

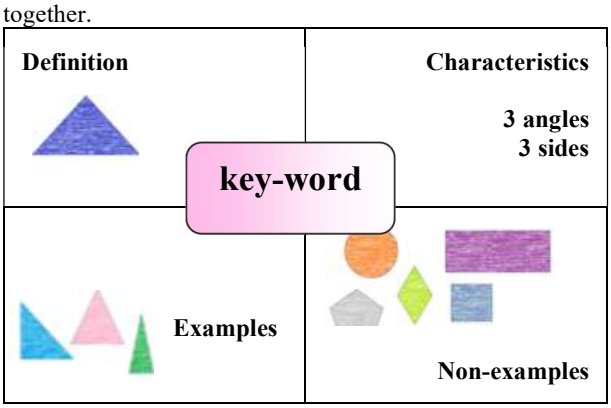

Figure 4 – Application example Primary Education (shapes)

An example for the Greek language lesson is given in the second model (Figure 5). The thematic unit is "the parts of speech" (verbs, nouns, adjectives, adverbs, etc.).

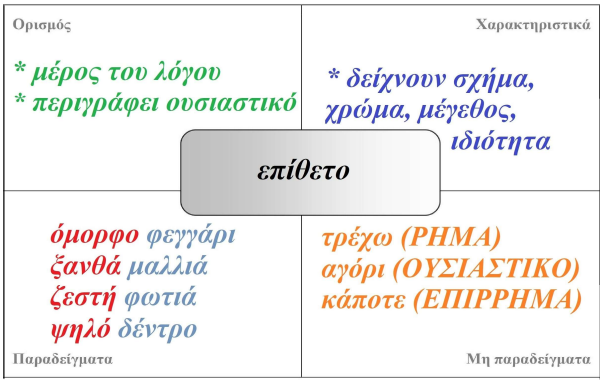

Figure 5 – Application example Primary Education (Greek language, adjectives)

In Figure 5 we see an example of a completed Frayer model for the term "*adjective*". In the definition field, the learners write "*part of speech, it is used to describe nouns*". In the characteristics field the learners write "*they show shape, color, size, property*". In the examples' field the learners can write various nouns accompanied by adjectives, highlighted in red (***beautiful*** *moon,* ***blond*** *hair,* ***hot*** *fire,* ***tall*** *tree*) and in the non-examples section the learners can write other parts of speech (*run-verb, boy-noun, once-adverb*) (Tsakalidou, 2021b).

9. Application examples in Secondary Education

In Figure 7 we see an example related for the German language lesson (Grammar). The subordinate clauses are examined in the 1st class of Lyceum. In the experts' groups, the learners are placed according to the subordinate clause type they are going to work with. E.g., an experts' group works with causal sentences, one with conditional sentences, and so on. Then, they return to the jigsaw groups and complete the Frayer models for all fields. Finally, the

presentation of the completed models in the classroom follows.

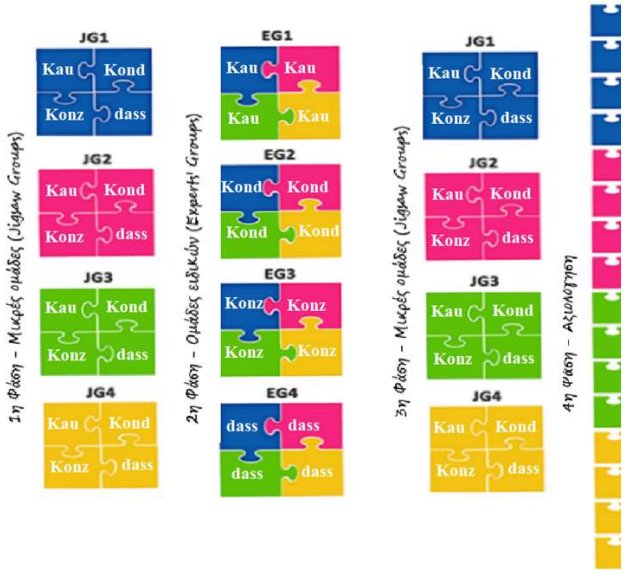

Figure 6 – Application example Secondary Education (subordinate clauses)

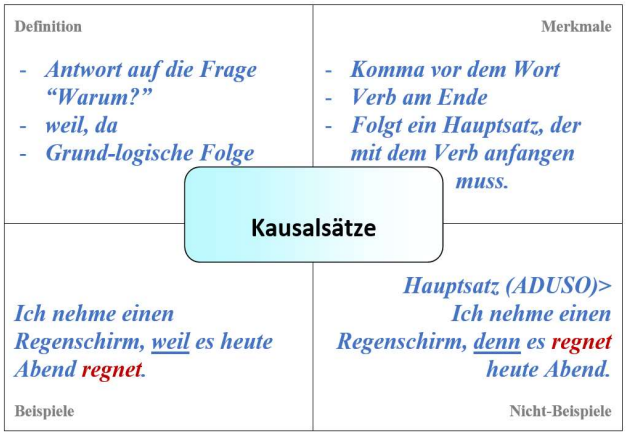

Figure 7 – Frayer model for the German language lesson (subordinate clauses)

In Figure 7 we see an example of the Frayer model for the subordinate clauses. In the definition field the learners can write: „*Antwort auf die Frage "Warum?". Weil, da. Grund-logische Folge".* That is: it answers the question "why?". It shows the cause, a logical consequence.

In the characteristics' field the learners can write: *"Komma vor dem Wort. Verb am Ende. Folgt ein Hauptsatz, der mit dem Verb anfangen muss.".* That is: There is a comma before the word „*weil* ". The verb is placed at the end of the sentence. If it is followed by the main sentence, then it starts with the verb.

In the examples 'field the learners can write an example: „*Ich nehme einen Regenschirm, weil es heute Abend regnet*. ", i.e., an example that contains a sentence starting with "*weil*". In the non-examples 'field the learners can write a synonymous example, with a different conjunction, e.g., "*denn*", which has the same meaning, but is not a subordinate clause (Tsakalidou, 2021b).

CONCLUSIONS

In summary, it is found that the Frayer model can be implemented in the jigsaw classroom in the foreign language lesson, as well as in other subjects, both in Primary and Secondary Education. That way, the learners can work with basic concepts (grammatical, lexical, syntactical, mathematical), mastering them to the fullest, as with the Frayer model they try to make correlations at four different levels, in terms of each concept. Therefore, they learn this concept more effectively. Researchers have also mentioned the positive effect of using the Frayer model for the learners' vocabulary (Alashry, Qoura, & Gohar, 2018; Mardiyah, 2014; Nahampun, 2018; Peters, 1974-1975), as well as the benefits from the implementation of the jigsaw method in the classroom (Aronson, 2002; Voyles, Bailey, Durik, 2015; Williams, 2004).

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SUBMITTED: JANUARY 2021
REVISION SUBMITTED: MARCH 2021
ACCEPTED: MAY 2021
REFEREED ANONYMOUSLY

PUBLISHED ONLINE: 1 JUNE 2021