

The Use Of The Cluster Method In Lectures On Theoretical Mechanics

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Abstract – The article discusses the possibility of using the cluster method in the organization of lectures on theoretical mechanics. In all sections of science, it is shown that by applying this method, it is possible to achieve the desired result based on the demonstration in the acquisition of science concepts by students.

Keywords – Cluster, theoretical mechanics, statics, kinematics, dynamics, power system, mechanical motion, vibrational motion.

The current spread of coronavirus infection around the world has had a negative impact on all sectors, including education. The opportunity to conduct traditional training in schools, vocational colleges, academic lyceums and universities has disappeared. A modular platform on the Internet was immediately set up to organize classes with students. Available materials from all disciplines were compactly placed on this platform. New teaching materials are being prepared by teachers and placed in the module. The next task is to increase the level of comprehensibility of the materials in the module to the student, to demonstrate the visual features.

In the presented works [1,2,4] the results obtained as a result of application of a method of increase of activity of students in lectures on theoretical mechanics are described. The results of the conducted pedagogical experiment are given. [3,5] studies have shown that Venn diagrams can be used in the study of theoretical mechanics.

In order to make the lectures on theoretical mechanics in the module system more understandable, it is necessary to present the course materials to the students in an understandable, simple and visual way. At the same time, the use of cluster-"information dissemination" method is characterized by good results. Clustering is an interactive pedagogical strategy that develops students' multi-faceted thinking, the ability to interact with the concepts being studied (event, event, concept, key word and phrase), to divide a phrase into its constituent parts, to divide it into parts, to know the location of each part. and provides an opportunity to obtain complete information about a given phrase, which will be the basis for his final memorable thoughts about the phrase.

When using clustering in lectures, the student will not only be able to independently and actively master the material, but also to monitor their knowledge and identify connections between key concepts and relationships in the cluster.

This interactive method is one of the most effective methods in the study of all branches of theoretical mechanics. In the statics section of the science, concepts such as force system, force system equilibrium conditions, force moment, center of gravity, force system, truss can be spread to the cluster. In the kinematics section, it is convenient to create clusters for the concepts of mechanical motion, point velocity, point acceleration, trajectory. In the department of dynamics, students can strengthen their knowledge and skills by spreading concepts such as the differential equation of motion, power system, vibrations, kinetic energy, momentum, momentum, mechanical system, kinetic moment, moments of inertia.

Figure 1 below provides an example of a cluster spread of a power system expression belonging to the statics section. First of all, the power system is divided into 5 components. Then these organizers are again divided into pieces. By using this method, the seemingly complex power system was broken down into parts that were simple, understandable, and orderly for students. Through this visual method, the student can easily master the topic being studied and apply the knowledge gained in problem solving.

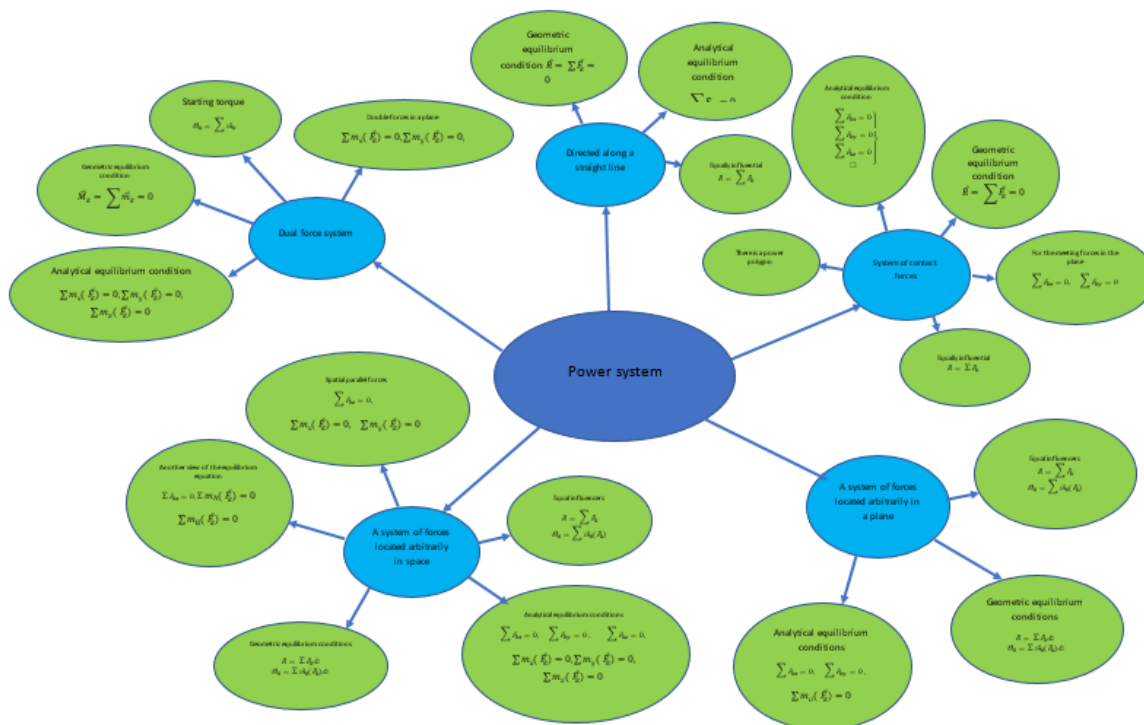


Figure 1

The spread of the concept of mechanical motion belonging to the kinematics section into a cluster is shown in Figure 2. Here, too, the base word is divided into constituents, the constituents are divided into the necessary parts, the original meaning and components of the base word are fully explained, and the role of each part in the overall system is even more useful and understandable for students. Another positive aspect of the cluster method is that the student learns the key words and phrases related to the topic being studied in a visual way. The reason in this case the knowledge gained will be stronger and more effective.

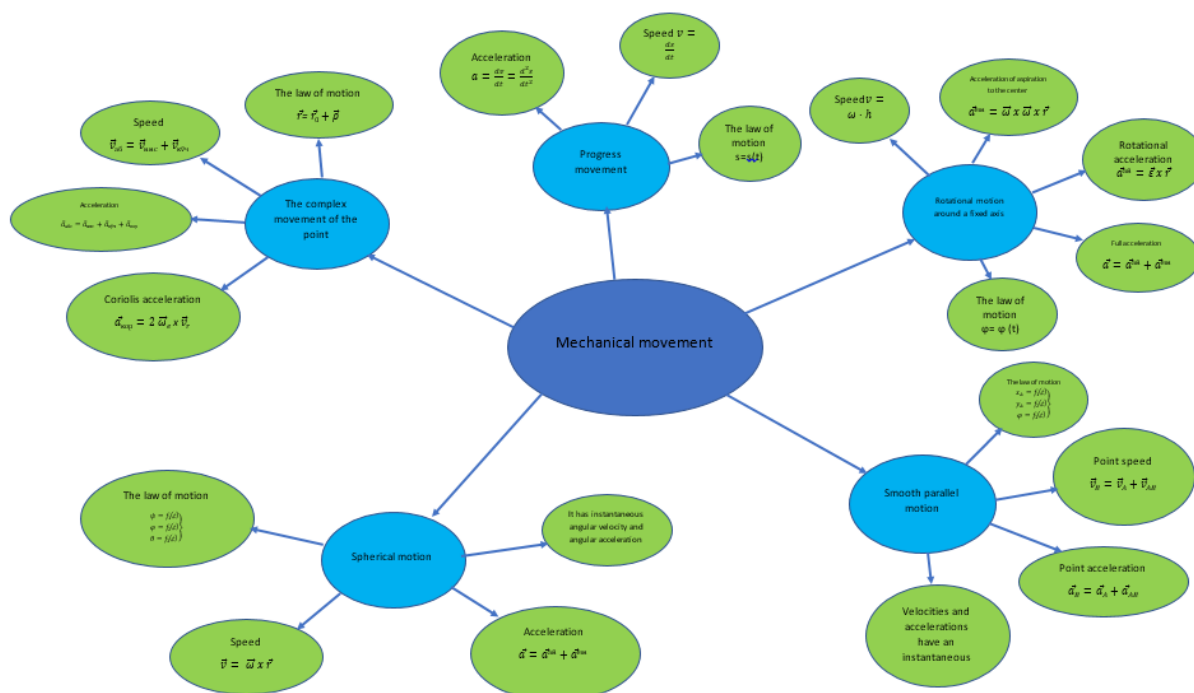


Figure 2

In short, as a result of the use of the cluster method in lectures, students deepen their knowledge, first by using the key words and phrases of the subject, then sections, dividing the subject into its constituent parts, distinguishing between them, knowing which part is where (hierarchy). By creating clusters, the student is able to demonstrate all the knowledge they have acquired, applying them to examples and problem solving. The visual organization of the lesson increases its level of acceptance by students and the level of knowledge of students exceeds the quality.

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