



Participatory Educational Research (PER)  
Special Issue 2016-II, pp., 45-50; 01 February 2016  
Available online at <http://www.partedres.com>  
ISSN: 2148-6123  
<http://dx.doi.org/10.17275/per.16.spi.2.5>

## Tool of Association Concept; Volume of Concept

Salih GÜLEN \*

*PhD Student/Teacher, Science Education, Ondokuz Mayıs University, Samsun, Turkey*

### Abstract

Concepts are the building blocks of science. Concepts which are the most important element in structuring the information are units of our thoughts. Concepts of science are increasing the ratio of students to associate these concepts with different methods, techniques and tools. The importance of the concept tools is great in the learning of concepts. Education of the concept would be useful if different concept tools are developing. Purpose this study; concept tools which advantage volumes of the atomic elements were prepared for determine the relationship between concepts. This concept tools was inspired by the science subjects in the preparation. Method; in this study, tool of association concept has been developed. Volume of atomic elements assembly using for provided knowledge about the elements and electrons in the 7th and 8th grade science class students. Results; It was added a new tools of association concept when existing. New and original a concept tool was obtained. It is named "volume of concept". Thanks to these tools the concept can be specified in a unity. Depending on the relationship between concepts, it is provides more collective appear. Volume of concept was prepared without the cost. Advice; volume of concept can be tested for applications in science education. Its format can be prepared in computer for students who forced the drawing. It investigated the effect on learning.

**Keywords:** concepts; sub concepts; volume of concept

### Introduction

It is important to correct teach the concept in science especially in the early years of school (Demirci ve Efe, 2007), Due to this importance, science educators research the teaching associating concept of science subjects to individuals rather than conduction on general issues in recent years (Coştu, Ayas ve Ünal, 2007). Concepts are the building blocks of science. Concepts which are the most important element in structuring the information are units of our thoughts (Gülen ve Demirkuş, 2014). Because of this, one of the purposes science educations is to learn meaningful and lasting concepts. This purpose, gives rise to the concentration studies to this area (Ercan, Taşdere ve Ercan, 2010). This is important that determining the relationship between concepts introduce and can be use tools of association concept in education. Educators, for the understanding of relationships between concepts; Concept maps, Concepts network, Meaning (Concept) Analysis Table, The Roundhouse and

---

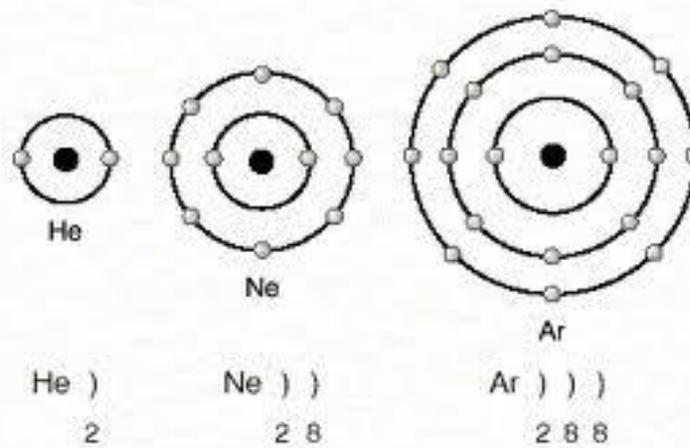
\* PhD Student/Teacher, Science Education, 19 Mayıs University, Samsun, Turkey  
Cumhuriyet, Şenerler street, 19 Mayıs/ SAMSUN  
[sgnova@windowslive.com](mailto:sgnova@windowslive.com)

Set of Concepts were developed and are using them widely in education (Demirkuş, 2015). Concepts of science are increasing the ratio of students to associate these concepts with different methods, techniques and tools (Taş, Gülen, Öner ve Özyürek, 2015). The importance of the concept tools is great in the learning of concepts. Education of the concept would be useful if different concept tools are developing.

**Purpose:** In this study, was prepared tool of association concept which utilizing the volumes of atomic elements to determine the relationship between concepts and terms.

**Method:** It was inspired from science subjects for preparation of this concept tool. Volume of atomic elements assembly using for provided knowledge about the elements and electrons in the 7th and 8th grade science class students. The volume of elements is provider of achievement information about the element.

**Figure 1:** Volume of Some Atomic Elements.



As shown in Figure 1, the electron of element which advantage the sorts in a specific order are specified volume of matters of education. Units in science lessons even the concept of subject which specifies number of concepts and the relationships between them in unit or topic can be presented in a specific order (Gündoğdu, 2013).

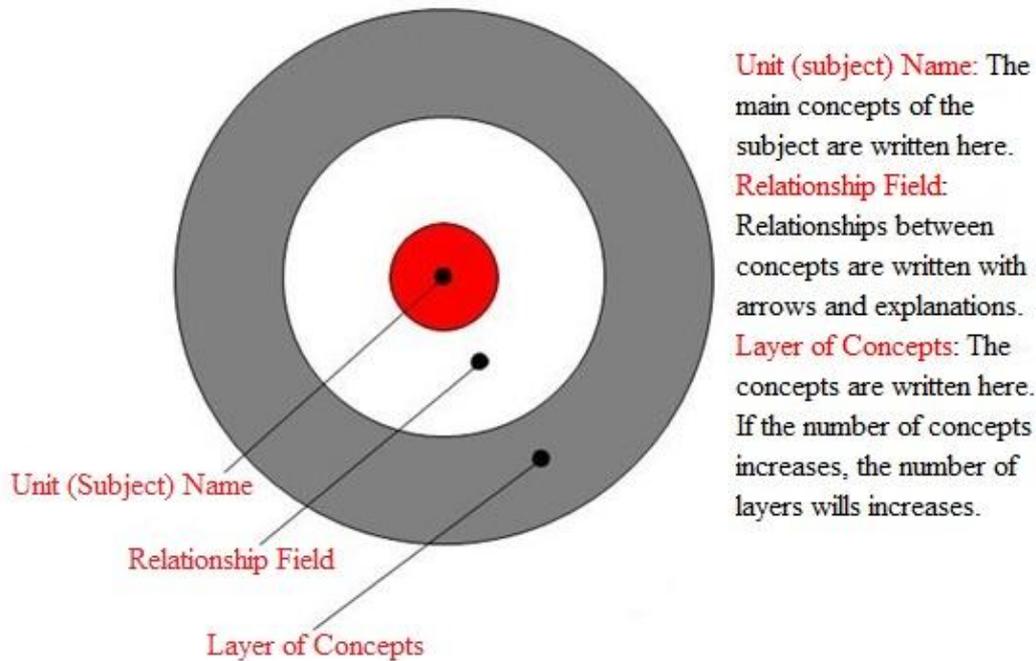
The volume of elements is achieved information about that element. From advantage the sequencing specific order the electron element are specified for the volume of science subjects. In this way, we can identify the concept of unit in science lesson and identifying the number of concepts with relations between them. In here, the unit (subject) name writeable instead of the core of elements and concepts writeable instead of electrons.

In the literature survey, there are no tools of association concept as volume of concept. Also there is not information about volume of concept in primary and secondary school book or help book. This study manufactured by researchers with the analogies. It is thought to be useful to science education.

As shown in the below figure, can be done volume of concept like volume of atoms in the unit. In this figure writing the main concepts of the subject in center (nucleus). It is placed concepts which related to the main concepts on layer of center. They can be located first degree concepts which connected main concepts in first layer and second degree concepts in

second layer. Due to this association the number of layers is increased by increasing the number of concept. The number of concepts in a layer is connected with subjects and to associate. Also is created relationship field between the layers. Thus stated that the relationship between the concepts.

**Figure 2:** Definition the Volume of Concept



This tool of concept can be drawn by hand or may also be prepared on computer. For example, the tool in Figure 2 was drawn with ConceptDraw Office PRO (demo).

Volume of concept can be made by following steps.

For volume of concepts;

- (1) 1. determined unit or subject,
- (2) 2. determined the main concepts of the subject,
- (3) 3. determined the sub concepts of main concept,
- (4) 4. Gradually, determined the below concept of sub-concepts,
- (5) 5. Drawn the central and layers of the volume of concepts,
- (6) 6. According to the concepts and relations between them are drawn oval boxes on the volume of concept layer,
- (7) 7. Written the concept on the box in the layer,
- (8) 8. used the arrows for to determine the relationship between the boxes in layers,
- (9) 9. Available the dashed lines to prevent complexity.

Above steps of process are provided for unit of "Structure and Properties of Matter" in elementary science books (6 class). Firstly, "Matter" was determined as the main concept. Then, was selected the sub-concepts in this topic. Concept is appearing which identified and

translated in table 1. Relationships between concepts were identified in table 1. The same relationship among concepts can be placed on the “Volume of Concept”.

**Table 1.** Concepts in Unit of Structure and Properties of Matter

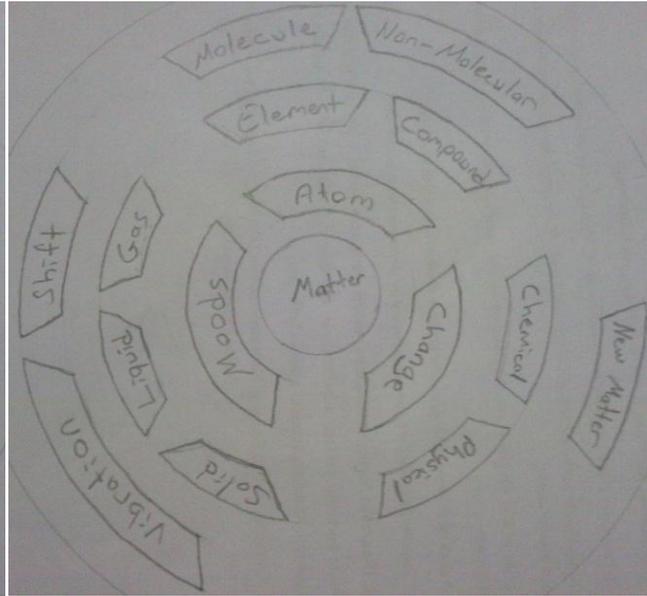
Turkish	in English	Turkish	in English
Madde	Matter	Katı	Solid
Halleri	Moods	Sıvı	Liquid
Atom	Atom	Gaz	Gas
Değişim	Change	Titreşim	Vibration
Fiziksel	Physical	Öteleme	Shift
Kimyasal	Chemical	Molekül	Molecule
Element	Element	Molekül olmayan	non-Molecular
Bileşik	Compound	Yeni madde	new Matter

Firstly, can be drawn a blank oval box (figure 3), then can be written concepts name into the box (figure 4), then can be drawn arrows between boxes (figure 5) and can be written relationships between concepts (figure 6).

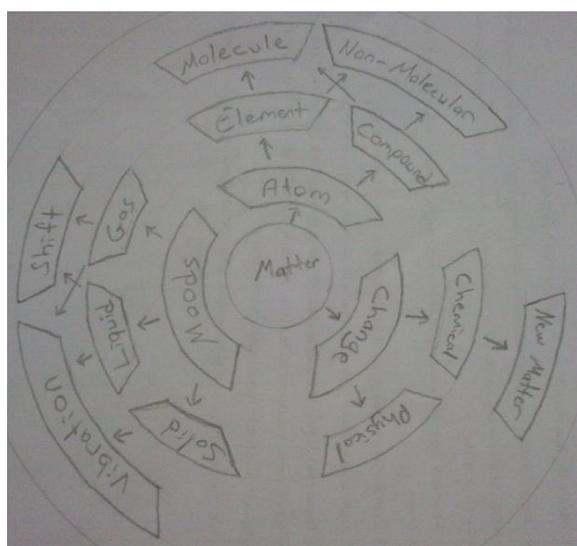
**Figure 3:** Volume of Concept Stage 1



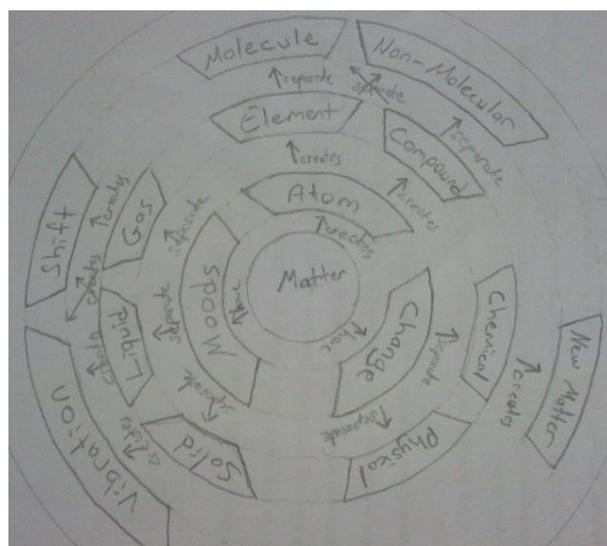
**Figure 4:** Volume of Concept Stage 2



**Figure 5:** Volume of Concept Stage 3



**Figure 6:** Volume of Concept Stage 4



Volume of concepts used to determine relationships between concepts in the subject of science. Additionally;

- A. increase the importance of the concept when hinterland external to inward,
- B. can be analyzed in depth the subject,
- C. can be used to summarize the subject,
- D. can be may make simpler the subject.

As described in the above information and samples, it is believed that volume of concepts will be useful for science education. Especially for teachers and students this is an educational tool.

### Results

It was added a new tools of association concept when existing. New and original a concept tool was obtained. It is named "*volume of concept*". Thanks to these tools the concept can be specified in a unity. Depending on the relationship between concepts, it is provides more collective appear. Volume of concept was prepared without the cost.

### Advice

Volume of concept can be tested for applications in science education. Its format can be prepared in computer for students who forced the drawing. It investigated the effect on learning. Volume of concept can be prepared in the form of banners or posters for easy learning.

### Reference:

Coştu, B., Ayas, A., & Ünal, S. (2007). Kavram Yanılgıları ve Olası Nedenleri: Kaynama Kavramı (Misconceptions about Boiling and Their Possible Reasons). *Kastamonu Education Journal*, 15 (1), 123-136.

- Demirci, N., & Efe, S. (2007). İlköğretim Öğrencilerinin Ses Konusundaki Kavram Yanılgılarının Belirlenmesi (Determination of Primary School Students Misconceptions about Sound Subject). *Necatibey Faculty of Education Electronic Journal of Science and Mathematics Education*, 1(1), 23-56.
- Demirkuş, N., (2015). Öğretim Materyali Geliştirme Ders Notları (Development Teaching Material Lecture Notes). <http://biyolojiegitim.yyu.edu.tr/ders/otm.htm> Date of Access: 14.09.2015
- Ercan, F., Taşdere, A., & Ercan, N. (2010). Kelime İlişkilendirme Testi Aracılığıyla Bilişsel Yapının ve Kavramsal Değişimin Gözlenmesi (Observing Conceptual Changes and Cognitive Structure with Word Association Test). *Turkish Science Education*, 7(2), 136-154.
- Gündoğdu, F. (2013). *İlköğretim Fen ve Teknoloji 8. Sınıf Ders Kitabı (Elementary Science and Technology 8th Grade Textbook)*. Ankara: Tuna Publishing.
- Gülen, S., & Demirkuş N., (2014). Güneş Sistemi ve Ötesi: Uzay Bilmecesi” Ünitesinde, Görsel Materyalin Öğrenci Başarısına Etkisi (The Effects of Visual Material on Students’ Achievement in "The Solar System and Beyond: Mystery of Space" Unit). *YYU Journal of Education Faculty*, 11(1), 1-20.
- Taş, E., Gülen, S., Öner, Z., & Özyürek, C. (2015). The Effects of Classic and Web-Designed Conceptual Change Texts on the Subject of Water Chemistry. *International Electronic Journal of Elementary Education*, 7(2), 263-280.

Table 1. Type your title here.

Figure 1. Type your title here.

Obtain permission and include the acknowledgement required by the copyright holder if a figure is being reproduced from another source.