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REMOTE TEACHING'S MANAGERIAL INNOVATION IN THE PANDEMIC: PLASMA METAPHOR FOR ONLINE CLASSROOMS

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ABSTRACT

The spread of Covid-19 has drastically disrupted every aspects of education including classroom as a teaching environment. The disappearance of traditional classes suddenly during the pandemic period caused the educational environment crisis. During this crisis, online classrooms were reinvented suddenly and entered the life of society. Naturally, in this sudden transformation, the online classroom phenomenon was not prepared. In emergency online teaching, it is necessarily followed by the maxim " The caravan is organized on the road". This work is also an effort to regulate the ongoing migration from the traditional classroom to the online classroom. In this study, managerial innovation and plasma literatures were examined together with the online classroom literature. Therefore, this study is a literature review. As a result of the study, the plasma class metaphor was proposed. This study, which examines the phenomenon of online classroom in plasma sample, only aims to offer an innovative perspective. The online classroom entered the literature with online education, the fourth and final stage of distance education. Plasma is the fourth state of matter. The online classroom is a newly discovered truth, just like plasma theory. This fact is thought to be a small clue to a very big truth. The plasma class metaphor represents an exploration effort for the future.

Key Words: Remote teaching, online classroom, plasma theory, managerial innovation

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1. INTRODUCTION

The Covid 19 pandemic has transformed traditional classrooms into online classrooms. Online classrooms are a phenomenon that has been debated for many years, mostly in higher education and beyond. Online classes were generally used in certificate programs and graduate programs before the pandemic (Allen & Seaman, 2005). After the pandemic, online classes had to be used suddenly at all levels of education.

While the classroom is replaced by emergency online classrooms, the focus is on technological innovation. But the situation is not limited to technology. Technological innovation will be insufficient to make sense of the emergency online transformation. Technological innovation is mostly related to technological transformation, while managerial innovation is mostly related to the social structure of the classes (Daft, 1978). So it is difficult to understand emergency online classrooms by focusing solely on technological innovation. In this context, managerial innovation can be useful in the process of rediscovering classes in the context of social structure.

On the other hand, managerial innovation is more difficult than technological innovation in terms of finding the most accurate before implementation and evaluating after (Birkinshaw at all, 2008; Fidan, 2018). Managerial innovation becomes more important especially in times of crisis such as pandemic. Because in crisis situations, it is vital to find solutions on a wider basis. In times of crisis, technological innovation and content is not the only concern. During these times, it should create an online classroom that supports learners (Bozkurt & Sharma, 2020). Managerial innovation is important in this context.

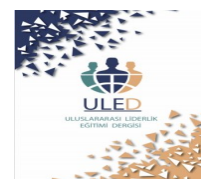
In this study, the phenomenon of online classroom is examined. In the post-pandemic sudden transformation, the advantages and disadvantages of online classes are revealed. Ways to make the online classroom advantageous have been sought from a managerial innovation perspective. As a result, plasma class phenomenon is discussed on the basis of plasma theory. The plasma metaphor reveals the structure of online classes. Plasma classroom metaphor offers options for maximum benefit in online classrooms.

1.1. Online Classes

Rapid advances in technology have facilitated remote classrooms instead of traditional classrooms. Online classes are shaped on the basis of an internet-connected computer, such as online learning, open learning, web-based learning, computer-mediated learning, blended learning and m-learning. Therefore, there are classes that provide the opportunity to learn from anywhere, anytime, in any rhythm and with any method. These classes can be called online classes (Dhawan, 2020).

The online classroom entered the literature with online education, the fourth and final stage of distance education (Moore & Kearsley, 2011). The online classroom is a virtual environment that enables connection between students, teachers and educational materials (Muirhead, 2000). In that case, we are talking about a virtual classroom on the screen of a device that provides access to the internet, not the traditional four walls. Online classrooms without walls improve the learning function of interaction among all participants in multiple formats and styles, and create educational experiences that result in high-level learning by all participants (Anderson, 2004).

Because of its various advantages, schools update their educational tools by opening online classes alongside traditional classes. It can be stated here that well-established schools carry their education to virtual classes at certain rates (Allen & Seamen, 2005). Lee, Yoon, and Lee (2013) state that online classes are created even at the primary school level. This study on virtual classrooms created via the internet via computers or smartphones reveals the reality of online classrooms at the primary school level.



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Exactly the level of equality and accessibility for online classes is questioned in pre-pandemic studies. In a study (Rose & Blomeyer, 2007), internet infrastructure and costs were questioned; another study (Tu & McIsaac, 2002) focuses on the social aspects of online classrooms. In the study that focuses on human resource preparation of online classrooms, it is recommended to examine the online classroom from multiple perspectives (Lane, 2013). Another study emphasizes the importance of the teacher factor in online classrooms (Yang & Cornelious, 2005).

The Covid 19 pandemic has re-determined the advantages and disadvantages of the online classroom phenomenon. First of all, it was seen that many preparations were not made. In this context, the pandemic has rapidly increased the perception and application of online classes. Mandatory conditions have demonstrated the importance of online classes (Dhawan, 2020). Online classrooms, a mandatory option in pandemic uncertainty, did not break communication between students and teachers. If students' academic and social development can continue to some extent, it is thanks to online classes (Fidan, 2020).

In the literature, the negative aspects of emergency remote teaching were stated due to technological innovation deficiencies (Adnan & Anwar, 2020; Barton, 2020; Daniel, 2020; Fidan, 2020; Hebebcı et al., 2020; Telli Yamamoto & Altun, 2020; Burns & Gottschalk, 2020). Barton (2020), for example, stated that emergency remote teaching poses technological difficulties for students, teachers and parents. In some studies, negative results were reported due to managerial innovation deficiencies. For example, in emergency remote teaching, problems have been observed in the context of social structure of classrooms, relationships and roles (Reimers, & Schleicher, 2020). Result of a study showed that, students were dissatisfied with online classroom in generally (Tang et al., 2020).

After covid 19 it has been seen that the roles of components such as students, teachers and parents should be reconsidered. The pandemic has forced managerial innovations in the context of education, as in everything else. The online classroom is defined as a collaborative community effort between teachers, parents and teachers (Aliyyah et al., 2020). The online classroom is an innovative learning environment provided by the internet. In the online classroom, there are virtual possibilities for ensuring students' access to learning resources, facilitating communication between students and teachers, and conducting collaborative work (Volery & Lord, 2000).

In recent studies in the literature, it has been predicted that in the near future, online classes will become the main foundation of education rather than being a secondary alternative. Rose, 2020; Telli Yamamoto & Altun, 2020). In addition, it is thought that current pandemic experiences will offer significant opportunities for online classes (Langlois et al., 2020; Shearer et al., 2020). In this context, plasma class metaphor is discussed in this study.

1.2. Plasma Metaphor for Online Classrooms

Plasma is the fourth state of matter. If the substance is exposed to heat again in its third state, the gas phase, it begins to ionize. As a result of ionization, gases have a new structure called plasma (Nishikawa and Wakatani, 2000; Howard, 2002). This new structure is a collection of particles and waves. Waves are in a continuous state of formation with particle movements. Generally, particles interact with each other and with waves (Davidson, 1972). In other words, plasma is defined as nonlinear particle mobility and the distribution resulting from this mobility (Gallagher, 2014).

Plasma is a product of quantum physics. Therefore, it is important to understand quantum thinking in order to make sense of plasma. The quantum perspective says that events and phenomena are unpredictable. From a quantum perspective, the relationships between elements of a phenomenon are more important than the elements themselves. Therefore, it can be stated that the plasma class that can be evaluated in the context of quantum is far from traditional classes. Also, the uncertainty emphasized by quantum is a natural property of plasma classes (Peres, 2006).



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The quantum perspective defines the plasma class as unpredictable and uncertain. There is a virtual system that connects everything. Events take place at a distance. There is remote control. There is a constant change, not stagnation or passivity (Turan, 2017).

When online classes are compared with traditional classrooms, they show differences that can be called the new normal of class phenomenon like plasma. Comparative online class inferences from all properties of plasma are summarized in table 1 (Bernstein vd., 1957; Davidson, 1972; Gallagher, 2014; Howard, 2002; Nicholson, 1983; Nishikawa & Wakatani, 2000; Türeci, 2001; Tonks & Langmuir, 1929).

Table 1.

Inferences from plasma properties for online classroom

Plasma properties	Online classes
Beyond known substance	Beyond traditional classes
Nonlinear	Almost nothing is linear
New invisible matter	New virtual classroom
Magnetic frame	No walls
Particle mobility	Breaks and displacements
Particles	Each student is in his own home
Conductivity	Very fast interaction
Waves	Not only students but also network
Self sufficiency	Internal motivation

Table 1 provides deductions from plasma properties for online classes. It is recommended to pay attention to the plasma properties when conducting remote teaching in online classes. Plasma is a surprising substance. In other words, plasma is beyond the matter known to science until the last century. It is a new phenomenon. Online classes also go far beyond the traditional classroom in this regard. Preparation for this new class phenomenon essentially requires a change of perspective. Because the most basic condition of performance in a job is knotted in perspective (Zaffron & Logan, 2010). So plasma metaphor is primarily an effort to create a perspective for online classes.

Plasma class, with its dynamic feature that constantly renews itself and its environment, can produce fast and accurate solutions to the changes of the unpredictable future. Ideal plasmas are non-collision-free and their density limits are infinite. Plasma particles can create an infinite amount of modifications under all conditions, with their property expressed as collision-free continuity (Nishikawa & Wakatani, 2000). Therefore, in plasma classrooms, participants can re-discover themselves and their environment in literally every encounter.

Plasma class has an agile structure. Agility, which is briefly defined as the ability to change direction quickly and accurately, is an important feature of plasma classes (Sheppard & Young, 2006). In the current environment of change and uncertainty, the phenomenon of pedagogical agility is discussed in order to make teaching efforts successful (Worley & Lawler, 2010). It can be stated that the Plasma class phenomenon supports pedagogical agility. Plasma classes are an agile learning teaching environment suitable for pedagogical agility (Morien, 2018).

Plasma represents the invisible state of matter in the universe. Plasma, which is defined as a vacuum by some, corresponds to 99% of the universe (Nishikawa and Wakatani, 2000). Similarly, it should be anticipated that in online classrooms, there may be more invisible than visible. Since there are more than one participant on the same screen, both observing the participants and focusing on the course content can expand the area of the



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invisible. Technological infrastructure also plays a role here. The individual technological tools of the participants also play a role in the connection quality. In addition, many variables such as student's home conditions, number of siblings and so on can play a role. Therefore, the invisible components of online classrooms affect the course in unpredictable dimensions.

Plasma has a self-sufficient energy through the interaction of particle and dispersion functions. High interaction, which seems negative at first sight, has positive results in plasma. Lightning strikes, lightning bolts and the sun can be embodied as self-contained plasma examples (Türeci, 2001). Similarly, plasma classes can be seen negatively at first glance with the dizzying interactions of individual students. As in the plasma example, individual mobility can generate an endless energy of learning. Here, it is important that each student develops a willingness to participate in the interaction, in a sense, internal motivation. The more students are motivated and participate in the interaction, the more online classes can produce quality results (Uysal & Kuzu, 2011).

2. METHOD

In this literature review, we summarize and discuss the plasma online classroom. The literature review was conducted, using systematic methods to identify and select eligible articles. References were selected from Dergipark and Google Scholar database. We searched that databases from their date of inception through November 2020 for eligible studies published in English and Turkish language. Also references were selected using search strings containing a combination of terms that included online class, remote teaching, plasma theory and managerial innovation. We have included any studies reporting results that might be useful to interpret plasma theory as managerial innovation to online classrooms. We summarized and drew together findings from these diverse and conflicting sources using synthesis and presented a metaphor. Metaphor is considered as the transfer of what is known about a subject to a new and mostly unknown subject (Tsoukas, 1991). The knowledge and experience conveyed through metaphors provide the opportunity to see, understand and manage the new in a distinctive way. Metaphor helps to highlight similar aspects of phenomena and capture a strong understanding. In this way, a reasonable perspective on the new field is developed (Morgan, 1998). This article aims to develop a reasonable perspective on the online classroom, using plasma theory as a metaphor.

3. FINDINGS

In this literature review, it was found that the online classroom phenomenon has been used with online education since the 2000s. (Moore & Kearsley, 2011). The inevitable rise of the online classroom over the past two decades has been found in the literature (Telli Yamamoto & Altun, 2020). However, the transformation towards the online classroom of the size of the pandemic period has not been seen before (Fidan, 2020). Therefore, after the pandemic, the classroom phenomenon has turned into an online form on a plasma screen.

Plasma literature, a new form of matter, can offer a different perspective on the online classroom, the new form of classes. (Nishikawa and Wakatani, 2000; Howard, 2002). The quantum point of view that revealed plasma has transformed the scientific world. Quantum thought has changed the way we view matter, redefining everything. The online plasma class phenomenon will also redefine class definitions. (Peres, 2006).

As a result of literature review, a plasma class model was produced in which the described properties of the plasma class are displayed visually. In this way, it is thought that the relationship between plasma properties and online classes can be revealed more clearly. Figure 1 is modelled according to the plasma properties.



Figure 1. Plasma classroom model

Figure 1 has been prepared in the example of online classes located on the computer screen. Plasma classrooms do not have walls. The computer screen and 20 individual screens on the screen are the walls of the plasma classroom. Each student is in the plasma class as proton (p), neutron (n), electron (e), quark (k) and unnamed particles (x). In the plasma classroom, each participant has a different temperature and intensity. Therefore, they show a small and large distribution similar to fragmentation and mobility characteristics. Some students may be positively charged, some negatively charged, and some neutrally charged. There may also be quarks and unnamed particles. In other words, the diversity of the participants cannot be explained by only three groups.

In addition to single particles, there are also large and small groups in plasma classes. The double-triple groupings expressed in different colours symbolize the nuclei, atoms and molecules in the plasmas. These groups can constantly separate and unite and differ at any time. In a sense, this depends on the lesson, the teacher and other variables. In other words, variables (course, teacher or method) can form positive or negative groups. These groups can be named as "those who do not like a lesson" or "those who attend the lesson a lot". In plasma classrooms, individual and group interactions continue in very different ways.

The part seen in black on the screen in the plasma classroom model is not a gap. Because plasma does not accept space. Plasma grades do not just contain particles (individuals). Plasmas are a collection of parts and waves. A new participant can join the loop at any time, or there is an instant change in sound or image related to the network. Therefore, wave mobility should be considered in plasma classes. In the plasma theory, it is assumed that the participants in each screen and even the living or non-living materials next to them are composed of parts and waves. Therefore, it is assumed that the substances and space contained in the individual screens may also affect the plasma class.



4. DISCUSSION and CONCLUSION

The online classroom has become a sudden reality of the new normal after the Covid 19 pandemic. This transformation can be described as the dizzying change that has been taking place for many years, reaching the speed of light. The change and transformation in the speed of light has brought along great uncertainties. In this environment of uncertainty, scientific work on online classrooms has increased. With this study, online classes are metaphorized with plasma theory and a different perspective is presented. The online classroom literature is studied together with managerial innovation and plasma theory literature. Plasma class metaphor has been introduced as a result of the literature research.

Plasma class is just a point of view proposition. The plasma classroom metaphor is an effort to draw positive inferences from remote teaching experiences during the epidemic process. Undoubtedly, the emergency remote teaching process has negativities in terms of education. However, it is possible to make positive inferences besides all the negativities. The current pandemic offers a unique opportunity to continue experiences that have served education well in the past, break away from the useless ones, and start imagining the new (Fidan, 2020; Langlois et al., 2020; Shearer et al., 2020).

In situations of crisis where traditional classes suddenly disappear, online classes have entered the field suddenly and widely, like the fourth state of matter (plasma). It is predicted that online classes will be used frequently in education after the pandemic (Rose, 2020; Telli Yamamoto & Altun, 2020). In fact, online classes are available before the pandemic. It only became visible during the pandemic period. Just like the plasma theory. Plasma also existed before the fourth state of matter was discovered. It is just waiting to be discovered. The plasma class phenomenon, which is urgently on the agenda under pandemic conditions, really awaits to be discovered. Even if the plasma classroom is discovered or not, it will continue to be found endlessly in the educational literature. Thanks to the pandemic, all levels of education have had the opportunity to get to know the plasma classroom reality, albeit necessarily. The plasma classroom will continue to bring news from the future and remind today's individuals of the future.

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