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Transformation of vape in social space: From medical technology to mode (A study on social construction of technology perspective)

Febriansyah

Universitas Airlangga, Surabaya, Indonesia, email: febriansyah-2020@fisip.unair.ac.id

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ABSTRACT

Vape or e-cigarettes emerged as a medical technology to help heavy smokers quit smoking or get rid of their addiction to tobacco cigarettes since tobacco cigarettes contain harmful substances that can cause many deadly diseases. In its development, vaping has transformed into a popular product which considered as a fashion or part of the lifestyle of young people. How did it happen? This conceptual article will answer this problem by using the desk study method and the Social Construction of Technology (SCOT) theory. This article finds that the relevant society or social group strongly influences the transformation or evolution of vaping. Vaping is interpreted as a fashion by the relevant community or social group. This interpretation continues to be negotiated in the social sphere so that some groups define vaping as a smoking technology in the future when tobacco cigarettes will be replaced by it. The author also sees the influence of consumerism culture under neoliberalism, which is the context in the construction of vapes.

Keywords:

Vape; E-cigarette; SCOT; Social Construction

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INTRODUCTION

Oza Rangkuti, in his Podcast account (Kesel Aja) mentions that the fashion characteristics of South Jakarta teenagers, known as jaksel/South Jakarta, when go hang out is using branded clothes and use pods or vapes. This expression is a proof that vaping has become a fashion or lifestyle for young people, especially in urban areas. The author encountered the same phenomenon in Surabaya. Many youths, especially those who wear branded clothes, hang out at cafes accompanied by vaping.

The popularity of vaping by urban youth is not surprising, considering that sales of e-cigarettes have continued to increase in recent years in big cities in Indonesia. In 2020, the e-cigarette user reaches 2.2 million, and there are around 5,000 outlets selling vapor (Putra, 2021). Globally, vapers or vape users are projected to continue to increase. In the analysis of Jerzyński et al. (2021) it was stated that by 2022 and 2023, vape users will reach more than

80 million users. The widespread use of vaping is indeed inseparable from the marketing of these electronic products. However, is vaping marketed as part of the fashion?

Vape or electronic cigarette was originally known as a substitute for tobacco cigarettes in its history. Vapes are considered low in nicotine and zero in harmful substances like tar. Reporting from Insider, e-cigarettes first appeared in 1927 and were designed by Joseph Robinson. However, the first commercial successful e-cigarette was made in Beijing, China, in 2003 (Brueck, 2019). The designer is a 52-year-old pharmacist and smoker named Hon Lik. It is reported that Hon Lik invented the e-cigarette after being inspired by the death of his father, who had lung cancer from tobacco smoking. From China, vaping then continues to spread and develop to various parts of the world. The World Health Organization (WHO) mentions that e-cigarettes are included in NRT or Nicotine Replacement Therapy, which uses electricity through batteries to deliver nicotine in vapor or electronic nicotine delivery systems (ENDS).

In Indonesia, vaping is estimated to have traded in 2012 (Dwianto, 2019; Gotts et al., 2019). However, conventional cigarettes still dominate the market. In 2015, vaping achieved the peak of success as a top-rated product. There are several reasons why then vape is loved. In a study conducted by McCausland et al. (2020) vaping use is driven by several factors such as common experience, vaping is considered a substitute for tobacco cigarettes, and vaping emits much smoke. Other studies have shown that e-cigarettes such as vaping are considered healthier, eliminating tobacco smoking addiction, and making them socially acceptable (Kim et al., 2017). A study by Ayers et al. (2017) found seven reasons for using an electric cigarette: low cost, choice of taste, safe usage, can be used in a room, having pleasant smell, and can stop smoking tobacco cigarettes and having a good social image. In addition, vaping becomes more popular due to becoming a part of creating social image or lifestyle.

The description above is the basis for the author in compiling this conceptual article. That is why and how vapes can be adopted as part of the lifestyle of urban communities. The author will use the social construction of technology (SCOT) approach. SCOT is different from the Determinism of Technology Theory which emphasizes that technology has a powerful and prominent role in changing human life. So humans will depend on technology. McLuhan is one of the adherents of this theory. His article entitled Medium is often quoted. In this article, as a reminder, McLuhan (2013) said that in operational and practical terms, the media is the message. The media referred to all forms of human self-extension tools or technology. McLuhan believes that will slowly shape human life. The pattern of human interaction will be controlled by the type of technology (Paramita, 2021).

The theory of technological determinism was widely used as a research theory in the 1980s (Arifuddin & Irwansyah, 2019). However, after that, sociologists began to critique and find new theories that provide a different perspective on technology. The theory in question is the social construction of technology (SCOT). SCOT grasping the view that humans can control technology in social life. According to Yusefikhah (2017), SCOT is based on human actions that shape technology. Technology cannot be understood without understanding the human social context. In SCOT's view, technology has strong ties to the socio-cultural community. Thus Social Construction of Technology must be based on historical, social, political, and economic analysis (Sari, 2015).

Nevertheless, before going any further, we must first look at how technology enters and is integrated into people's lives. Technology enters as a component that already has social principles attached to it. SCOT opens up sufficient space for variation and selection to incorporate technology into the social system. However, what needs to be remembered is that neither party is sufficiently decisive in this integration, both optimistic and pessimistic.

The papers that are often cited in SCOT studies are those of Wiebe E. Bijker and Trevor Pinch. The work of these two social scientists describes how to understand technology in SCOT. Pinch & Bijker (1984) mention three basic concepts, namely:

1. Interpretative flexibility or a concept that shows how technology should be flexible when used in social life. Social groups in society carry out the trigger for this flexibility of interpretation. Technology does not run linearly in people's lives but a multi-directional manner (Pinch & Bijker, 1984). It refers to the different routes negotiated by the different social groups involved. In negotiations, this often leads to a higher level of uncertainty. Bijker argues that in its development towards one best design, technology continues to be considered by social groups with interests that lead to flexible interpretations.
2. Closure and stabilization. Bijker and Pinch distinguish two mechanisms for technological closure: rhetorical closure and closing by redefining. This rhetorical closing is a concept where the technology has reached a 'perfect' form. After going through many interpretations, the social group or community finally managed to agree on a solution to reduce problems related to technology. Meanwhile, the closure means that social groups are still negotiating the technology. This social group is trying to redefine where or how the technology is placed.
3. The broader context or basic concepts that affect technology in a broader context. This concept is related to social and political conditions. So, slowly technology will relate to and even form values and norms in society. Referring to the basic concept of closure, social groups, when defining or adopting technology, will always be influenced by the context in which and when they interact.

Mario Peia tries to formulate SCOT into two aspects; social aspects and technological aspects (Peia, 2010). The social aspect consists of interpretive flexibility or relating to how technology can have different meanings, relevant social groups depending on the social groups that use it, and closures that allow technology to be integrated into society. In contrast, the technological aspect consists of aspects of architecture, law, market, and norms.

Through this theory, the author will examine the process of how the broader community adopts vaping. Previously, research on vaping in social spaces had been conducted several times, especially those related to social construction. For example, research by Mixdam et al. (2020) analyzes the social construction and meaning of the use of e-cigarettes among women who use e-cigarettes. The findings of this study show that the social construction of vaping occurs in three stages; externalization, objectification, and internalization. The three stages of the process also affect the meaning of the use of e-cigarettes for women who use e-cigarettes. Another research is research by Santana et al. (2018), which analyzed the social construction of e-cigarettes (vape) as a substitute for tobacco cigarettes for active smokers in Denpasar City. This analysis found that the economy, environment, and social media encourage tobacco smokers to vape. In addition, the significant factor and symbol value in vaping is quite dominant motifs. Other research suggests that vaping has entered the consumptive conception (Hutapea & Fasya, 2021). In this case, vapes are consumed or used as objects to satisfy hobbies in the perspective of fan culture and the study of popular culture.

However, there are no or many studies examining vaping in the context of technological, social construction, or there are no studies that see vaping as a technology that is part of the social process in society, especially in the contemporary era. Therefore, this conceptual article will fill that gap. Jaakkola (2020) explained that conceptual papers or articles always start from certain concepts, theories, or research domains that are internally incoherent or incomplete in some important respects and then introduce other theories to

bridge the observed gaps. This conceptual paper's aim or core argument rests on how vaping has turned into a fashion or lifestyle. How vaping as technology transforms from a solution to replace tobacco cigarettes that are medical to become a people's lifestyle.

METHOD

This article is conceptual. Conceptual articles or papers usually focus on integrating and proposing new relationships between constructs (Jaakkola, 2020). Thus, the responsibility lies more with developing logical and complete arguments for associations rather than testing them empirically (Gilpin & Goldberg, 2015). However, conceptual papers have the same goal as empirical papers: to create new knowledge by carefully constructing selected sources of information that are combined according to a set of norms (Jaakkola, 2020). The method in this paper will use a qualitative approach. The author will examine the formulation of the problem that he has mentioned in the background. As explained by Johnston, the purpose of qualitative research is to understand and explore the core of a problem (VanderStoep & Johnson, 2009).

Regarding data, because this article is conceptual, the data used are secondary data, which are usually found in qualitative studies. In conceptual papers, arguments are not derived from data in the traditional sense but involve the assimilation and combination of evidence in the form of previously developed concepts and theories (Hirschheim, 2008). This data in qualitative research is in the form of words (text) and descriptions of documents, observations, and transcripts (Neuman, 2007). These data will be obtained using the desk study or desk review method, while the secondary data will be obtained without going through field research first (Hague et al., 2016). According to Hague et al. (2016) this desk study method will satisfy the author because it will find a lot of scattered data, leading to the research objectives.

RESULT AND DISCUSSION

1. Vape is Technology

Through the explanation of the theory, the main problem of this conceptual article will be described by the author. However, to open this discussion section further and in-depth, the question that must be answered first is whether vaping is a technology? Therefore, before further elaborating on the answers to these questions, we must find out what technology is.

Humans and technology have long been intertwined. Historically, technology was created in tandem with changing human needs. Then human life to technology. Several scientists have given their views on how technology becomes a crucial part or extension (extension theory) of human life. In his paper, Steinert (2016) identifies four formulations: scientists who explain that technology is an addition to the human organism, technology is an addition to the body (lived body), technology is an addition to human intentions, and the last is the addition of human abilities.

Ernest Kap put forward the first formulation. In 1877, Kapp declared that the technology was the projection of human organs. He gives examples such as the hammer, which is the addition of the hand. The telegraph was considered the thinking of the human nervous system, and the machine, which Kapp considers, has a way of working similar to humans where the machine requires food in the form of coal to produce or increase its energy.

The second formulation was put forward by several scientists such as Maurice Merleau-Ponty, Don Ihde, and H. De Preester. Technology is an extension of the body (lived body). The body is considered an open system that can incorporate external

means. Merleau-Ponty gives an example of a walking stick for a blind person. Merleau-Ponty said the stick entered the body and became part of it. So the stick will help feel the texture of the road for the blind. In the process, humans will be in an embodiment relationship with the technology used. This relationship of embodiment, said Don Ihde, focuses on human attention to the perceived world rather than its aids. It means that the technology that is transplanted into the human body is always transparent. However, it is not always neutral because there is subjectivity for every human being who uses it.

Rothenberg put forward the third formulation of the relationship between technology and humans, who says that technology is human intention. The intention is considered as a kind of intermediary between desire and the outside world (Steinert, 2016). Rothenberg gave the example of the farmer and his intention to drive away the crows that continued to eat his rice. Then he made a scarecrow which then represented his intention.

Marshall McLuhan expressed the last formulation, who developed a theory from the three previous arguments. McLuhan (2013) says that technology does lengthen not only the five senses and intentions but also human abilities. Ability here occurs in the broader scope (Steinert, 2016). He gave an example of a train. The train is a technology that expands humans' ability to move and transport humans on a larger scale. In this case, the capabilities referred to in this formulation are the speed, scale, or pattern of traditional human activities (Arifuddin & Irwansyah, 2019).

Clive Lawson also expressed thoughts related to technology extending human abilities. Lawson (2008) said that technology has a causal power that humans use. However, the intrinsic causal power of this technology is harnessed for purposes not aesthetic or consumption (direct) but to expand human capabilities. In essence, technology has implications for changing patterns of human life and further accommodating new technologies. Here Lawson wants to reaffirm what is called technology. That so-called technology is a tool that can change or develop human life. Then the question now is whether vaping is a technology?

Let us return to the description of the history of the presence of vaping. Vape, commonly known as an electric cigarette (e-cigarettes), is an electronic device used by humans today as cigarettes. Therefore, vaping cannot be separated from the history of the development of cigarette use in human life.

The emergence of e-cigarettes was marked by the discussion of multidisciplinary scientists about the dangers of nicotine and tar substances contained in tobacco cigarettes. These scientists make an agreement with cigarette entrepreneurs to reduce harmful substances in cigarettes and inform the embedded content in each product's packaging. As a result, in the 1990s, modified tobacco cigarettes such as Advance and Omni appeared. These products are similar to cigarettes which were later referred to as cigalikes and smokeless tobacco products. However, long before that, e-cigarettes first appeared in 1963 in the United States. The cigarette was promoted by Herbert A. Gilbert and patented in August 1965. The creation of the e-cigarette was encouraged for the use of smokeless tobacco cigarettes and as a safe means and method for smoking.

E-cigarettes began to be noticed when Hon Lik created Ruyan (one of the first types of e-cigarettes marketed) in 2003. Ruyan then arrived in the United States market. In the United States, Ruyan was patented as an electronic atomizing cigarette that serves as a substitute for tobacco cigarettes and as a medical technology to help smokers to quit smoking tobacco (U.S. Department Of Health And Human Services, 2016). From Ruyan, in 2010 various e-cigarette brands continued to grow.

As is well known, e-cigarettes do not use paper and tobacco components but consist of various electronic components. Generally, e-cigarettes consist of three main parts: the battery, atomizer, and cartridge (Electronic Cigarette Association, 2009). These three components have their respective functions. The battery is a part or source of electric power, the atomizer part that heats and evaporates the nicotine solution usually consists of two types RTA (Rebuildable Tank Atomizer) and RDA (Rebuildable Dripping Atomizer), and the cartridge is a component that contains a nicotine solution or e-liquid. E-liquid is a liquid solution that will be heated into an aerosol that the user inhales. E-liquids typically use propylene glycol or glycerin as a solvent for nicotine and flavoring chemicals.

Regarding the combustion process to produce steam, there is usually a Firing Button on the body of the vape. This Firing button is a trigger for the battery to generate electricity channeled to the atomizer, which burns up the e-liquid to produce steam. In its development, the components or structures of e-cigarettes are constantly being updated. The first generation of e-cigarettes looks like conventional cigarettes. The color and size are adapted to tobacco cigarettes as the device is white and the mouthpiece is brown. This model is often referred to as cigalikes. There are other products in the first generation which are shaped like pipe cigars. Then there are longer or shorter models, and the colors start to vary from cigarettes in general. These models use a cartridge design that is used to hold e-liquid.

The second generation of e-cigarette devices is often referred to as using tank systems. This e-cigarette device is relatively larger. So the second generation of e-cigarettes holds more e-liquid. Next-generation devices are increasingly varied. Even users are left to modify the device or build their own device, which is often referred to as a mod. Variants of this device then continue to appear under various names and brands.

Regarding this type of vape, Candra Bagus said in general that there are three types of vape: pen vape (pen type), portable (portable), and desktop vape (Mixdam et al., 2020). This type of pen is similar in size to a tobacco cigarette, while a portable vape is a bit bulky and has several components that can be used. These components include an atomizer, mod (device), battery (if e-cigarettes use an external battery), cotton, wire, and liquid. E-liquid. Lastly, desktop-type vapes are bulky and cannot be carried everywhere. It can only be used at home or in stores.

From 2012 to 2014, there were 460 brands of e-cigarettes sold on the internet, and there were 7700 flavor variants (Zhu et al., 2014). In the research process, Zhu et al. (2014) said that the number of brands and flavor variants increased. According to researchers from the Southeast Asian Tobacco Control Association (SEATCA), the manufacture or supply of various variants is one of the factors why vaping is loved. Another factor, the widespread use of cigarettes, comes from external sources such as vape marketing tactics and e-cigarette product designs. However, before these two factors, vaping or e-cigarettes were already considered a medical product or a potential smoking cessation tool. Therefore, many of the early vaping users were people who wanted to quit smoking tobacco.

From there, we can say that vaping is a technology. Borrowing the argument from Lawson (2008) above that technology is a tool that has benefits in human life. Therefore, vaping is a technology created by humans that is useful in dealing with addiction to tobacco cigarettes which are considered to have a bad impact. Although later in the history of its development, vaping has experienced various interpretations and has been associated with various kinds of problems, especially that e-cigarettes are dangerous.

Lately, there is a lot of buzz about the absence of government regulations in various countries for these cigarette innovations (Lyu et al., 2021). However, apart from that, the audience for vaping continues to grow. Its use no longer makes vaping a medical device but part of people's lifestyles, especially young people; as Kim said, the pattern underlies the use of e-cigarettes arises from hedonic and utilitarian factors (Kim et al., 2017).

2. Vape in SCOT Perspective

In several studies conducted, the vape industry has formed a fan culture (Hutapea & Fasya, 2021) or a new subculture. In urban areas, vape communities continue to grow. In the perspective of technological, social construction, or SCOT, these communities are referred to as relevant social groups (Peia, 2010). These relevant social groups are agents or groups that interpret technology.

In the concept of interpretative flexibility, integrating technology into society is always negotiated. In this case, some groups of people interpret vaping, which was originally a smoking cessation tool or a substitute for tobacco cigarettes to minimize the dangers of nicotine and tar, as a famous artifact. Several previous studies stated that vaping has changed or been interpreted as a lifestyle symbol (Hutapea & Fasya, 2021; Mixdam et al., 2020; Santana et al., 2018). The symbol then determines the social class of the user. Therefore, a person can be categorized into a particular class or social group using a vape. As stated by Oza Rangkuti, it is possible that when someone uses a vape, they will immediately be called a South Jakarta Citizen.

The next concept related to the SCOT perspective is closure. Using the approach of Pinch & Bijker (1984) that closure means a group agreement on the definition of the technology used. Vape today is no longer agreed upon as a substitute for tobacco cigarettes but is used to symbolize social image. It can be seen how vape actors or producers present various variants, both types, and e-liquids consisting of various flavors. Making this variant is based on the logic of consumerism. That many choices will follow the characteristics of each consumer. In other words, every vape product follows the tastes of each user.

Moreover, seeing that the vape industry is already in great demand by large companies and celebrities. Celebrities, especially on social media, become icons of these products. For example, Babe Cabita and Arief Muhammad have e-liquid products with their brands.

Meanwhile, the involvement of big companies in the vaping industry takes this e-cigarette product even further. Vape or any e-cigarette product will be used as an evolution of cigarettes where it will become a new cigarette in the future. With the help of communities and organizations that support vaping, these big companies, who are sometimes long-time players in the tobacco world, smoothly launch vaping with the slogan anti-tobacco smoking. Tirto.id once reported how the Indonesian Personal Vaporizer Alliance (APVI) and several other pro-vape communities formed the Tar and Smoke-Free Movement (Gebrak). It is stated in the report that APVI is the entry point for giant companies in marketing vapes to Indonesia. Previously, it was noted that these companies had funded various research institutes to state tobacco harm reduction globally. What APVI and large companies are doing is part of the second closure mentioned by Bijk and Pinch, namely closure or closure by redefining. It means that there is an attempt to make vaping the only form of cigarettes in the future.

What the vape community and companies do shows how the current conditions are, especially regarding the growth or transformation of vaping in the social space. In other words, add a more comprehensive context element that reads here. As explained

by Pinch & Bijker (1984) that the wider context relates to the social, political, and economic context that surrounds the technology. So, as is well known, both Indonesia and globally are currently experiencing what is known as neo-capitalism or neoliberalism. In neoliberalism, the culture of consumerism is the pillar of people's social life. Therefore, vaping is transformed into a symbol or social image of a particular group.

In addition to reviewing these three elements, the author sees that there is interference from elements or technical aspects in constructing vapes. Based on Peia's (2010) approach, the technical aspects include architecture, law, market, and norms. The architectural element of vaping relates to the physical components that make up e-cigarettes. As the author mentioned above, the vape component generally consists of three main parts: the battery, atomizer, and cartridge. Meanwhile, other components that are no less important are e-liquid, cotton, and wire. For vape sizes, there are various kinds, namely pen models, portable models, and desktop models. The most widely used vape models are pen and portable vapes. These two types of vape designs are the main attraction because they can be taken anywhere. Vaping is also better in terms of convenience of use because it no longer uses lighters but electricity. So users only need to charge the vape battery. In addition, various designs in the form of images, temperature measuring screens, and colorful plates embedded in the vape body make users have many choices.

This attraction is closely related to the existence of vapes in the market. The market potential for vaping is increasing. Even during the Covid-19 pandemic, the vape industry experienced a decline, but the enthusiasm for adopting e-cigarettes has never been extinguished. It is estimated that there will be around 68 million e-cigarette users worldwide in 2020 (Jerzyński et al., 2021). With celebrities and influencers involved in the vape business as brand ambassadors or becoming the owner of one of the vape brands, the potential for vaping in the market will be even more substantial. The existence of communities and vape shops that do not only operate in the field but also on social media is a trigger in itself. Then vaping competitions such as cloud-chasing, cloud trick, and various other competitions encourage the trend of vaping usage to continue to grow.

However, the widespread use of vaping was later read by some analysts - especially health scientists - as a bad thing. Several studies state that vaping has adverse effects such as addiction, especially among young people. Therefore, there is a need for accompanying rules (Lyu et al., 2021). The article by Jarmul et al. (2024) states that the current state of e-cigarette safety and regulation is very similar to efforts to regulate tobacco smoking in the 1960s when cigarette marketing was widespread, and research on the health effects of smoking was scarce and contested. In Indonesia, several reports about this regulatory issue continue to emerge, including the issue of vape excise that must be enforced immediately.

In addition to the legal aspect, norms are one of the aspects that regulate the use of vaping. Too much steam from vaping sometimes makes people annoyed, especially when vape users use it in public places. The steam is disturbing to people around, interlocutors, and small children. Some people even complain that the vapor interferes with their vision.

CONCLUSION

In this conceptual article, the author examines how vaping has transformed from what was initially conceptualized as a medical technology to become part of the lifestyle or fashion

of society, especially among young people. In the beginning, the author explored the history of the creation of vapes or e-cigarettes as medical technology. E-cigarettes are believed to help heavy smokers quit or get rid of their addiction to tobacco cigarettes. By reducing the nicotine content and eliminating tar and smoke, e-cigarettes will become a tool that can change conventional smoking habits, which have the effect of causing many diseases such as cancer.

However, during their development, e-cigarettes turned out to be functional. The actors involved in it drove e-cigarettes into a different industry. Initially, only in the form of certain groups, it became large, and its users spread worldwide over time. In several big cities globally, including Indonesia, the vape industry continues to grow. Interestingly, vaping is not sold as a health product but as a lifestyle support product in this industry.

The author uses the Social Construction of Technology (SCOT) approach or the social construction of technology to see the vaping phenomenon. Previously, the author defined in advance that vaping is a technology. In terms of function and the physical components that compose it, vaping is a technology, in this case, medical technology. However, slowly when the process of integration into the social space, vaping was adopted as a new cigarette technology. This argument is referred to in SCOT as a flexible interpretation (Interpretative flexibility). When vaping arrived in the community by specific communities vaping was interpreted to be different from the purpose of its initial creation. Then another SCOT concept used in viewing vaping as a product of social construction is closure. Here the interpretation of vaping is closed as a symbol or image of social class. Using a vape means that someone will be classified as a South Jakarta citizen who has a higher social class. However, within closures, there is a second group that never stops defining technology.

Regarding vaping, the authors found pro vape organizations that continue to make movements against tobacco cigarettes in order to smoothen or formulate vaping as a market product that is feasible and safe for consumption. Here, the author sees an attempt to interpret vaping as a cigarette in the future. The last concept in SCOT is the broader context. The context behind its transformation is the ideology of neoliberalism, in which all aspects of economics, politics, and health are fused into a consumerist culture.

In addition, the author also uses Peia's approach regarding the technical aspects that drive changes or the social construction of vaping. The technical aspects include architecture, market, law, and norms. These four aspects have played a significant role in constructing vaping to become part of the fashion or lifestyle of young people.

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