Virtual Reality in Military Training to Maintain Indonesian Military Readiness in The Era of Covid-19 Pandemic

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ABSTRACT

During the COVID-19 pandemic, there have been many changes to human activities, not to mention Indonesia's military armed forces (TNI). Despite the COVID-19 pandemic, threats to national security still exist. There are even some potential threats that developed during the COVID-19 pandemic and could explode at any time. This article is written based on a qualitative method and used literature study approach of various literature that related to the topic. The author wants to show the importance of maintaining Indonesian Military Armed Force (TNI) readiness by continuing military education and training with some adjustments. Virtual Reality has become the solution to this problem. With fully immersive system technology, VR can provide an experience that is closest to reality. So that even in a pandemic condition with a policy of restricting human activities, military readiness can still be maintained.

INTRODUCTION

The Covid-19 (Corona Virus Disease 2019) is a global health problem. The WHO (World Health Organization) officially declared the status of novel corona virus is a global pandemic on March 11th, 2020. The act is based on the escalating spread of the virus outside of China and it caused over 118.000 cases of coronavirus illness in over 110 countries (Ducharme, 2020). Indonesia reported the first two positive cases on March 2nd, 2020 (Ihsanuddin, 2020). The virus spread significantly time by time and massively to various regions in Indonesia. On July 7th, 2021, Indonesia already reported 2.345.018 confirmed cases and 61.868 death because of Covid-19.

At a media briefing in the beginning of the Covid-19 appearance, WHO director-general, Dr. Tedros Adhanom Ghebreysus said that the pandemic is not just a public health crisis, it is a crisis that will touch every sector. In a strongly connected and integrated world, the impacts of the disease beyond mortality (those who die) and morbidity (those who are unable to work for a period of time) has become apparent since the outbreak (McKibbin & Fernando, 2020). The outbreak caused an economic slowdown in China due to disruption in the production process and it affected the global supply chain. Gradually, the economy was getting worse with restrictions in transportation between countries which further slowed global economic growth.

The President of Indonesia announced the Covid-19 Pandemic as a National Disaster on March 14, 2020, through the Head of Badan Nasional Penanggulangan Bencana (BNPB). The president also formed a Task Force for the Acceleration of Handling Covid-19 (Widyawati, 2021). The same thing happened in Indonesia, the virus spread brutally. The government responded to this situation by making a restriction policy of people's mobility to cut the spread of the virus called Pembatasan Sosial Berskala Besar (PSBB), but since the policy was implemented, the Indonesian economy was getting worse and leading to recession. The government was seeking various solutions to be able to restore the economy and keep trying to supress the spread of the virus. However, new virus mutations that are easier to infect humans and cause more severe symptoms appeared (Widyawati, 2021). Since the beginning of 2021, there has been a very large spike of Covid-19 cases in Indonesia. The government decided to reimpose stricter policies on people's mobility in early July 2021. As long as there is an increase in Covid-19 cases in Indonesia, the government will continue to implement policies in restricting people's mobility and interaction. Until now, no one can predict when the Covid-19 Pandemic will end completely.

The existence of Covid-19 Pandemic does not obstruct conflict between countries. Conflict that happened continued throughout the pandemic. Marius Mehrl et al. found out that Covid-19 crisis has no effect on the global level of armed conflict (Mehrl & Paul W Thurner, 2021). Even though there were some government regulations and recommendations from the United Nation in limiting the spread of the virus. His research also indicates that conflict increased in Middle East by an estimated 20 weekly battle events per country. There was an increase on the intensity of the violence at an early stage from March to August 2020, when it approximately doubled in the three countries, particularly in Libya (Daw, 2021). Although there was a decrease in conflict tensions from September to December 2020, there is still potential for conflict to increase during the pandemic.

The Covid-19 Pandemic has exacerbated conflict in already fragile states. In parts of Western Africa and in the greater Sahel region, rebel groups have used the state preoccupation with Covid-19 crisis to escalate and violence (Berman, Couttenier, Monnet, & Ticku, 2020). In Asia, especially in the Middle East, conflicts that have occurred for years have escalated again during the pandemic. The armed conflict between Israel and Palestine continues during the rise in cases of virus infection in both Palestine and Israel. The conflict has worsened conditions in Palestine because several health facilities were destroyed during the attack. In Indonesia, there was also an armed conflict during the pandemic Covid-19 (Santoso, 2021). There were several attacks on members of Indonesia's National Armed Forces while on duty by a group of terrorists in Papua. Terrorist acts of suicide bombings also occurred during the pandemic, although not as much as in previous years. However, in this pandemic period, with more activities at home and greater access to social media platforms, the spread of radicalism has increased in Indonesia (Maharani, 2021). It could be a potential threat where this radical tenet can become an action one day.

In the midst of a pandemic today, there are escalations of threat in the national, regional, and international scope. The TNI (Tentara Nasional Indonesia/Indonesia's Military Armed Force) is required to be able to carry out its duties under any conditions in upholding state sovereignty, maintaining territorial integrity, and protecting the entire nation. The TNI must be prepared to face these threats. Military training must still be carried out despite the government's policy of restricting human movement. The purpose of this study is to explain the importance of the readiness of the TNI in dealing with actual and potential threats. VR (Virtual Reality) might be the

answer in military training in the midst of Covid-19 pandemic so that TNI readiness could be maintained.

LITERATURE REVIEW

Development of VR

Virtual reality is a very powerful and compelling computer application by which humans interact with computer-generated environments in a way that mimics real life and engages various senses (Burdea & P., 2003). Nowadays, VR is popular in games and entertainment, but actually it has also been used in other fields, such as medicine, oil exploration, mining exploration, engineering, automotive, and so on. VR can reduce time and cost, and lead to increase quality, in the development of the product in the automotive industry and any other fields (Lawson, Salanitri, & Waterfield, 2016).

The first design of VR was found in the 1950s by Morton Heilig with a prototype in 1962, but there was no financial support so the further development was stopped. Heilig designed a classic virtual reality called Sensorama which used 3D visual, audio, haptic, olfactory stimuli, and wind to provide an impressive experience (Rheingold, 1991).

Fig.1. Morton Heilig's Sensorama

In 1961, HMD (Head-Mounted Display) was founded by Philco. This device allows the user to know the position of the heard's user. BOOM (Binocular Omni Orientation Monitor) is one of the most famous HMD that invented by Ivan Sutherland in 1968 known as 'Sword of Damocles', but this device needed to be hung to the ceiling because of its size and dimentions. The Sword of Damocles was capable of tracking both the position of the user and their eyes and updating the image of its stereoscopic view according to the user's position (Boas, 2013).
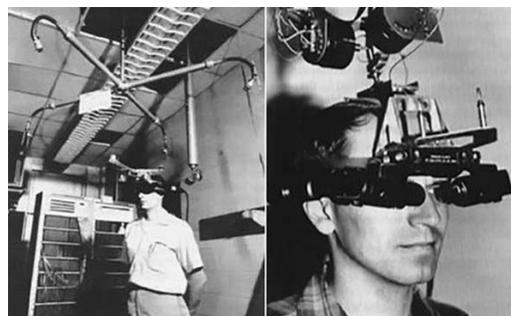

Fig. 2. Ivan Sutherland's HMD 'Sword of Damocles'

In 1977, wire data gloves worked by fiber-optics was found by Richard Sayre and created by Tom DeFanti and Daniel J. Sandin. This device used light sensors with flexible tubes that captured physical data such as bending of fingers.
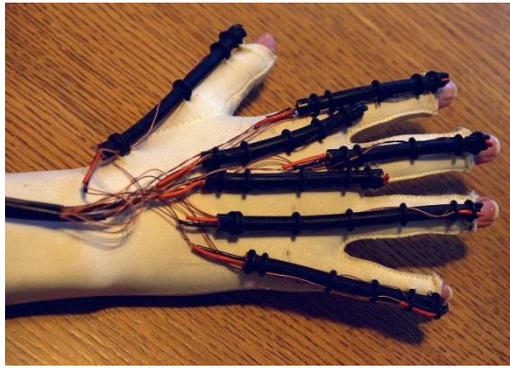
Fig. 3. The first wired glove 'Sayre Gloves'

Those three devices are the common VR related devices. There has been a lot of research and development of those devices that supports VR technology to further develop three experience concepts in using VR, such as immersion, perception, and telepresence.

Indonesia's Military Armed Force

The TNI (Indonesia's Military Armed Force) has an important role in national defense, especially in defending territory of Indonesia, protecting national sovereignty, protecting national integrity, and keeping the safety of the nation from any threats from within or outside of the country (Indonesia Defense White Paper, 2015). As a defense element, TNI has functions in preventing threats, taking action against threats, and restoring security conditions. In order to build national defense posture and improve capability of national defense, Indonesian Defense Minister made 9 Primary Defense Policy which two of them related to TNI itself. The first is personnel development with right sizing and proportional growth principle that is able to adapt with current conditions. The second policy is formation of reserve defense components to support TNI.

In the education of TNI soldiers, there is a philosophy that is followed, namely 'Dwi Warna Purwa Cendikia Wusana', which means realizing the role of soldiers as patriot fighters, proficient and skilled in their profession as a national defense force (Peraturan Panglima Tentara Nasional Indonesia Nomor Perpang/51/IX/2008). Due to the development of science and technology, as well as the development of strategic environment, TNI are increasingly being demanded to be more professional so that it is necessary to carry out gradual, multilevel, and sustainable education and training. Soldiers are expected to have a good mental personality, intellect, and good posture and abilities. The education and training of TNI soldiers aims to increase the potential of the soldiers so that they have the fighting spirit, knowledge, skills, and physical conditions needed to carry out their duties. The education and training was implemented but TNI soldiers did not stop until a certain point, but continued until the end of their career.

SHRM (Sustainable Human Resource Management)

Human resources are an important element in the organization. In an organization, human resources role as the driving force of the organization and the guarantor of the organization to survive. In addition, human resources also assist the organization in achieving its organizational goals. An understanding of SHRM can be in the form of the continuity of an organization's existence that continues to emerge as a result of good HR management, so with the presence of human resources, the organization can continue to advance and develop, and survive. The second understanding of sustainable HRM is the continuous management of human resources, so that human resources become more qualified and the capacity and capability of HR continues to increase (Kramar, 2014).

METHODOLOGY

This study used a qualitative research method. Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem (Creswell, 2009). This research aims to understand and find out the possibility of VR technology being used in the TNI in an effort to maintain the quality of soldiers in terms of human resources, in the midst of the Covid-19 pandemic which limits their activity, especially in military training.

The data collection technique used in this study is literature study. Authorconducted this research through a collection of qualitative documents such as books, journals, government policy documents, news, and other sources that are relevant to the topic, including a topic about military armed force's condition during the pandemic, VR technologies, HRD, and Indonesia's government policy.

This research begins with searching for information on the topic from journals, articles, and books on several websites. Some articles and journals were found through Google Search, Google Scholar, and the Republic of Indonesia Defense University's online library. The collected data will be analyzed in three steps. The first is data condensation, then data display, and the last conclusion.

RESULTS AND DISCUSSION

Along with the development of technology and information, as well as the development of the strategic environment, the TNI is required to always be professional in carrying out its duties as a national defense force. A good human resource management is needed, especially in military education and training. In terms of education and training, there are three important criteria that must be owned by TNI soldiers and those criteria become the goals of TNI's military education and training. There are good mentality & personality with high motivation and dedication, intellectuality that includes extensive knowledge & reliable skills, and proporsional body posture & good physical abilities. TNI soldiers need to be trained step by step, gradually, and continuously.

Good mentality and personality with dedication and high motivation can not be achieved instantly and quickly. It takes months or even years of education and training to ensure the doctrine of education can be instilled in soldiers. At least it takes three months to be able to make a value into a habit, as is done in basic military education and training in the TNI. In Indonesia, the TNI is divided into three fields or 'matra', namely the TNI AD (Army), TNI AU (Air Force), and TNI AL (Navy). Each dimension has its own special skills and knowledge in carrying out defense tasks in land, air space, and water areas. TNI AD which operates on land has the knowledge and skills in maintaining the security of the land border area. TNI AL has the skills and knowledge in maintaining security at sea and enforcing the law at sea, as well as conducting naval diplomacy. TNI AU is tasked with maintaining security in the area of national jurisdiction.

In addition to these three dimensions, the TNI also has Elite Indonesian Special Forces, in dealing with various types of threats, such as Kopassus (Special Forces Command) which is tasked with direct action to destroy enemy logistics, Combat SAR, Anti-Terror, Advance Combat Intelligence, facing the threat of separatism and rebellion. In addition, there is also a Satbravo-90 tasked to cripple the enemy' defense equipment in supporting operations and prosecution of terror and piracy in the air. Denjaka is one of the special forces who specializes in combat and combat intelligence on ships, offshore installation, and coast areas. There are also several more special forces in Indonesia. Not only three fields or 'matra' receive specific education and training, but also those special forces. In fact, most of the special forces are educated and trained harder than other TNI soldiers, according to the duties and responsibilities that must be fulfilled.

Proportional posture and good physical ability are needed by the TNI soldier to support their activity. Most of the tasks are outdoor and in extreme conditions, thus making agility and endurance become the success factors in operations. Without a fit body condition, it is impossible

to cross seas, climb mountains, and attack the enemy. Physical training is carried out by the TNI every day with the additional load time by time, so that soldiers can achieve excellent physical abilities.

The Covid-19 pandemic has hampered the training and education of soldiers. Restrictions on human interaction and activities make soldiers unable to train physical activities as usual. Furthermore with the government's policy of making efficiency of the budget and allocating it to the handling of the Covid-19 pandemic, some education and training activities have to be cut. It has an impact on the quality and quantity of education and training. Joint training also cannot be carried out. Some soldiers outmaneuver by doing activities at home, but the achievements are not optimal. Supervision was also not done thoroughly, so the achievements of each soldier were not monitored.

In Indonesia, VR applied in several field but mostly in games and entertainment. There are application of VR but limited to visual only, for example used in virtual travelling created by travel agent to provide a travel experience and in aviation but still using VR technology originating from aboard. In developed countries, such as the United State, VR is already used in the military field. In the 1960s, the US military developed a combat simulation system. VR is listed as one of the seven key technologies that will ensure the dominance of the US force in the 21st century. The application of VR in the US military mainly includes virtual training, battlefield exercises, and virtual weapon manufacturing. Applying VR in military field is inline with the US's realistic demand and development direction of reducing the personnel and material losses. Moreover, the technology can improve the effectiveness of the military training (Liu, Zhang, Hou, & Wang, 2018). The combination between VR and AR (Augmented Reality) also used by US military in combat training. AR technology can create a display of the user's avatar and the outdoor environment, with precise GPS location. This combination of technology is possible to generate a big battlefield environment with multiple users in one system (Haar, 2005).

Indonesia's Military Armed Force should be able to adopt this technology. VR technology will be very supportive in national defense, especially in preparing defense human resources to face threats. The use of VR in military training and education will be very helpful, considering that VR technology can be a fully immersive system, where it gives users the closest to reality through high quality of graphic and performance as well as complete stimuli. The soldier will be easier to understand the material and surrounding environment, because it is also balanced with practice. In addition, military education and training are mostly dangerous and threaten the safety of soldiers. Since 2002, there have been several cases of accidents that have resulted in the death of TNI soldiers during the military education and training.

The existence of new technology certainly requires adaptation. The TNI needs to adapt to the use of VR technology if it is to be used for education and training for its soldiers. Disapproval may occur, but it should be understood that technology is developing very quickly, the use of VR in developed countries has been carried out, and over time, the demands for efficiency and effectiveness are becoming more real.

CONCLUSION

It is highly important in maintaining military readiness considering that threats to national security can come anytime and anywhere, even during the Covid-19 Pandemic. The threat of armed conflict continues during the pandemic and other potential threats that persist during the pandemic may explode after the pandemic is over. Based on Sustainable Human Resources Development, military education and training must still be applied to maintain the quality of soldiers, but with the policy to limit human activities, Indonesia's military armed force has difficulties in providing education and training for its personnel. Virtual Reality technology can solve this problem, where soldiers can still get military education and training without having to meet other people in person. With a fully immersive system, VR technology can provide an experience that is closest to reality.

Application of VR in military education and training will also make the operation become more effective and efficient.

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