



## INCREASE STUDENTS' INTEREST THROUGH THE MBT-03 TRAINING MACHINE APPLICATION INTO AK GUN PRACTICE COURSE

Nguyen Duc Trong<sup>1</sup>,

Nguyen Duc Thanh<sup>2i</sup>

<sup>1</sup>MA, Ho Chi Minh City University of Education,  
Vietnam

<sup>2</sup>Assoc. Prof. Dr.,  
Ho Chi Minh City University of Technology and Education,  
Vietnam

### Abstract:

This article aims to briefly assess the advantages and limitations of the BT-03 shooting machine when it is applied to the practical teaching of the practical module of National Defense and Security Education (NDSE) at Ho Chi Minh City University of Technology and Education. Through surveying the Likert scale (5 levels) with 340 students and 28 experts, the author conducted quantitative statistical analysis to compare the interest of learners and lecturers after their experience with this device. The results showed that both students and lecturers highly appreciated all 10 observed variables affecting the excitement through the application of the MBT-03 exercise machine. This is the basis for universities and national defense education centers to consult and invest in shooting machines that combine information technology in teaching. Thereby, it helps to innovate teaching methods in a positive way and contributes to improving the quality of NDSE.

**Keywords:** technology, defense and security education, excitement, MBT-03 shooting machine, application

### 1. Introduction

The application of technology in teaching (educational technology) is becoming popular and changing traditional teaching methods, thereby increasing learners' interest and improving teaching quality. In which, the subject of NDSE is typical [3, 8, 9].

The current popular and effective teaching technology can be applied and developed in the following directions: Building lectures (PowerPoint, Canva, myViewBoard); Classroom Management (Moodle, Schoology); Exam organization and

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<sup>i</sup> Correspondence: email [thanhnd@hcmute.edu.vn](mailto:thanhnd@hcmute.edu.vn)

exam fraud prevention (Azota, EduNow); Using smart technology devices (Smart Interactive Displays, Interactive Projectors); Data storage and information sharing (Google Drive, OneDrive, FreeCommander) [1]. For the subject of NDSE, representing practical creativity, it is impossible not to mention the MBT-03 shooting Machine.

The MBT-03 shooting machine is the product of scientists from the Weapons Department, Military Technical Academy (Vietnam) with many outstanding advantages over existing training equipment, due to the application of modern technology.

MBT-03 is a training aid device that uses optical imaging technology, connects to a computer, and uses simulation techniques to practice and evaluate the results of AK submachine gun training. It is used for units of the armed forces and for teaching students.

Putting this device into use assumes high accuracy at shooting ranges of 100m or reduced ranges (error  $\pm 1$ cm on target). In particular, the postures and movements of the shot are almost realistic, the trigger force is almost like the real feeling.

Vivid image (computer screen shows gun dribbling during aiming). When the trigger is pulled, the bullet wound is left on the target with a simulated explosion. In particular, it can be practiced in all weather conditions. In addition, the computer will automatically calculate the score, read the results to the speaker as well as store and print it to the printer [10].

The initial application of the MBT-03 device to teaching the practical course of defense and security education at the Center for National Defense, Ho Chi Minh City University of Technical Education has brought positive effects by raising the interest of students.

## **2. Materials and method**

### **2.1. Samples and research methods**

The research sample includes 340 male and female students with normal health belonging to HCMUTE's faculties, who have participated and completed the practical module of NDSE; a collective of lecturers of NDSE (organic and visiting) of the Center for NDSE, HCMUTE (28 people).

The research methods include methods such as Analysis and synthesis of documents, Sociological investigation, Math and statistics.

### **2.2. Building survey tools (questionnaire)**

After finding out the theoretical basis and designing the questionnaire, the research was conducted in the following two steps:

**Step 1:** Preliminary research was conducted through a pilot survey of 30 students based on some pre-prepared criteria and interviews to explore related issues.

**Step 2:** Formal research. On the basis of the calibrated scale after interviews and mock surveys, the official survey was sent to interview lecturers and students.

### 2.3. Interest assessment tools

#### a. Likert scale - 5 levels

To solve the research problem, we conducted interviews with two subjects (students and lecturers) with 2 questionnaires on the Likert scale - 5 levels: Totally agree. 5m); Agree (4m); Normal (3m); Disagree (2m); Totally disagree (1m). In which, the distance value = (Maximum - Minimum)/n= (5 - 1)/5= 0.8.

**Table 1:** Evaluation of mean values by interval

Mean	Significance
1,00 – 1,80	Totally disagree
1,81 – 2,60	Disagree
2,61 – 3,4	Normal
3,41 – 4,2	Agree
4,21 – 5,00	Totally agree

#### b. Measuring the reliability of observed variables by Cronbach's Alpha coefficient

Cronbach's Alpha coefficient (Cronbach, 1951) is the trust coefficient used to test the correlation scale between pairs of observed variables. This method is to help remove the observed variables with insufficient reliability (with the coefficient of correlation and the total variable less than 0.3). In other words, if a measured variable has Corrected Item - Total Correlation  $\geq 0.3$ , that variable meets the requirements [5].

Using the t-student distribution is a probability distribution used to estimate the mean of a population to establish confidence intervals for the estimate of the population mean and is also used in the hypothesis testing process [11].

In the topic, using t-student to compare the two mean values of the two sample groups of lecturers and students about the assessment of observed variables affecting students' interest through the application of the MBT-03 shooting machine.

Using the t-student distribution to estimate the mean of a population to establish confidence intervals for the estimate of the population mean and also used in the testing of statistical hypotheses [11].

### 3. Results and discussion

#### 3.1. The initial situation of teaching and learning the practical module of NDSE at the Center for NDSE, HCMUTE

HCMUTE operates under the mechanism of self-reliance and comprehensive self-responsibility (Decision No. 973/QD-TTg dated June 30, 2017). NDSE work is concerned by the Party Committee, School Council, and School Board of Directors, led and directed closely, the Center for NDSE presides over and develops plans together with agencies, and departments throughout the school to effectively carry out the tasks of NDSE for students.

The scale of training and teaching NDSE is about 6000-6500 students/year. NDSE teaching space is nearly 5ha. The staff and lecturers of the NDSE Department are young,

healthy, energetic, enthusiastic, have a high responsibility in their work and always identify well the tasks of dedication and service to learners. Facilities for the subject of NDSE at the University are properly invested. Specifically: Sports field, training ground, model of learning equipment, sound, light, military equipment, guns and other specific equipment to serve well for learning practical contents;

HCMUTE's Center for Defense and Security Education is fully equipped with military equipment: AK-47, CKC, B40, B41 gun models; converted AK-47 gun, MBT-03 training machine, set of fake sound equipment and other equipment (according to Circular No. 01/2018/TT-BGDDT). Particularly, the MBT-03 training equipment has been equipped with 07 sets. This is a necessary condition for organizing teaching and has contributed to raising students' interest through the practical training session of Defense and Security Education.

### **3.2. The level of interest of students and lecturers after applying the MBT-03 shooting machine**

The curriculum is applied according to Circular No. 05/2020/TT-BGDDT dated March 18, 2020 of the Minister of Education and Training on the NDSE Program in pedagogical intermediate schools, pedagogical colleges and universities and higher education institutions.

Accordingly, the total number of periods of the program is 165 periods, including 04 modules (theory and practice): Session 1 - 45 periods (theory) divided into 09 sessions, of which there are 08 lessons studied in the classroom and 01 field visit.

Module 2 - 30 periods (theory) divided into 06 sessions (study in the room); Module 3 - 30 periods (14 theoretical periods, 16 practical periods) divided into 06 sessions (outdoor study); Module 4 - 60 periods (04 theory periods, 56 practical lessons) divided into 12 sessions (outdoor learning). Thus, the practical course with the application of the MBT-03 shooting machine belongs to 72 periods of Module 3 and Module 4.

After 2 years of practical application of the MBT-03 shooting machine for Defense and Security Education classes, interest results have been obtained in teaching and learning in a positive and positive direction. The obtained survey results presented in Table 2 reflect the agreement to confirm the superiority of the observed variables affecting the excitement of lecturers and students.

Specifically: 78.6% of lecturers' opinions and 95.3% of students' opinions agree with YT1\_Simple operation; 75% of lecturers' opinions and 92.6% of students' opinions agree with YT2\_Quick implementation of practice; 92.8% of lecturers' opinions and 91.2% of students' opinions agree with YT3\_Feeling (force of trigger) is like shooting a real gun; 89.3% of lecturers' opinions and 10.7% of students' opinions agree with YT4\_Sound effects, vivid images; 82.1% of lecturers' opinions and 17.9% of students' opinions agree with YT5\_High reliability and accuracy; 89.3% of lecturers' opinions and 10.7% of students' opinions agree with YT6\_Less affected by weather and climate conditions; 92.9% of lecturers' opinions and 86.5% of students' opinions agree with YT7\_Favorable

layout; 85.7% of lecturers' opinions and 86.8% of students' opinions agree with YT8\_Analysis of errors in each key area of the practitioner; 82.1% of lecturers' opinions and 85.6% of students' opinions agree with YT9\_Store the results in the computer and print the results easily; 96.4% of lecturers' opinions and 92.4% of students' opinions agree with YT10\_Safer than shooting a real gun.

Comparing the observations of the same subjects of the lecturers, it was found that the agreement overwhelmingly prevailed over the disagree level in all 10 observed variables. This is clearly shown by the calculated chi-square indexes which are larger than the table's chi-square (the difference is statistically significant with  $P < 0.05 \sim 0.01$ ). Similarly, in the observed variables in the same student object, the level of agreement overwhelmingly dominates over the disagree level in all 10 observed variables of the calculated chi-square index, which is larger than the table chi-square (the difference is a statistically significant difference with  $P < 0.001$ ).

Comparing the judgments of observed variables between lecturers and students through the Pearson Chi-Square index, it was found that all 10 variables on the level of assessment of factors affecting the excitement of lecturers and students through All MBT-03 shooting machine applications have  $\text{Sig} < 0.05$ . Because of  $\text{sig} < 5\%$ , so the corresponding variables between the two subjects of lecturers and students are related.

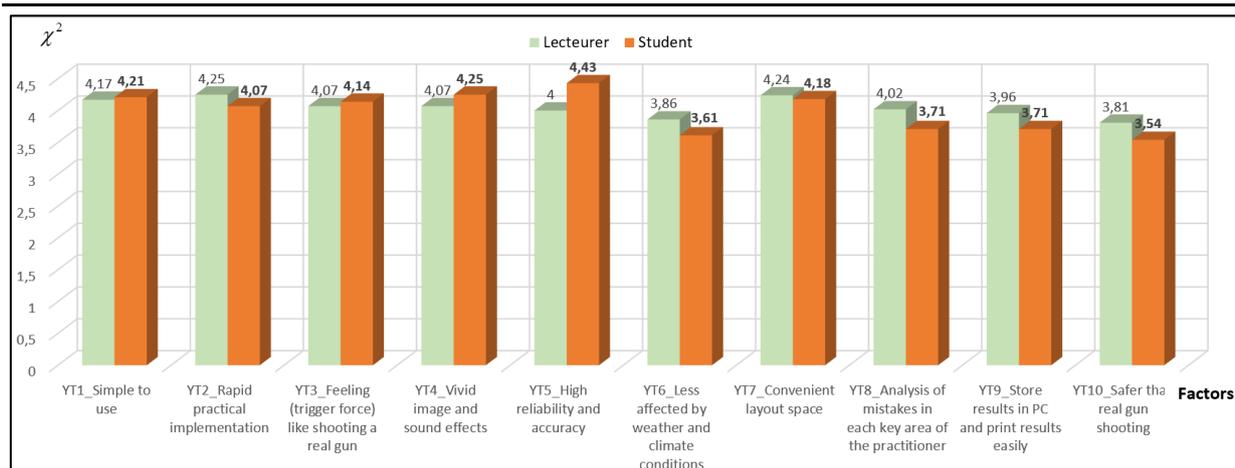
This is even more obvious (when surveyed using the Likert scale - 5 levels) to compare the values of observed variables between lecturers and students through the t-student index. The research results in Table 3 and Chart 1 also show that the observed variables are highly appreciated by both lecturers and students. The mean values of the observed variables assessed by the lecturer ranged from 3.81 to 4.25. In which, the criteria most appreciated by lecturers "YT2\_Implement practice quickly" mean = 4.25; the criteria rated the highest by students is "YT5\_High reliability and accuracy" with = 4.43... It can be seen that there is no significant difference in the values of observed variables between lecturers and students ( $\text{Sig} = .017 \sim .814 > .05$ ). Overall, both students and lecturers highly rated all 10 observed variables, mean = 3.54 ~ 4.43 (in the range of Agree to Totally Agree). Or it can be concluded that there is no significant difference (similarity) about the excitement through the application of the MBT-03 exercise machine between lecturers and students.

**Table 2:** Comparison of factors affecting the excitement of lecturers and students through the application MBT-03 shooting machine at Center for National Defense, HCMUTE

Criterion	Objects	Agree		Disagree		Comparison in the same object		Comparison between lecturer and student	
		$n_i$	%	$n_i$	%	$\chi^2$	P	Pearson Chi-Square	Asymp. Sig. (2-sided)
YT1_Simple to use	Lecturer	22	78,6	6	21,4	4,57	<0.05	12,87	.000
	Student	324	95,3	16	4,7	279,01	<0.001		
YT2_Rapid practical implementation	Lecturer	21	75	7	25	3,90	<0.05	29,88	.000
	Student	315	92,6	25	7,4	140,16	<0.001		
YT3_Feeling (trigger force) like shooting a real gun	Lecturer	24	92,8	4	7,2	7,14	<0.01	4,18	.041
	Student	310	91,2	30	8,8	130,66	<0.001		
YT4_Vivid image and sound effects	Lecturer	26	89,3	2	10,7	8,64	<0.01	4,33	.037
	Student	302	88,8	38	11,2	116,16	<0.001		
YT5_High reliability and accuracy	Lecturer	23	82,1	5	17,9	5,78	<0.02	6,44	.011
	Student	306	90	44	10	123,30	<0.001		
YT6_Less affected by weather and climate conditions	Lecturer	25	89,3	3	10,7	8,64	<0.01	10,69	.001
	Student	303	89,1	37	10,9	117,92	<0.001		
YT7_Convenient layout space	Lecturer	26	92,9	2	7,1	10,2	<0.01	7,05	.008
	Student	294	86,5	46	13,5	102,50	<0.001		
YT8_Analysis of mistakes in each key area of the practitioner	Lecturer	24	85,7	4	14,3	7,14	<0.01	7,38	.007
	Student	295	86,8	45	13,2	104,16	<0.001		
YT9_Store results in PC and print results easily	Lecturer	23	82,1	5	17,9	5,78	<0.02	6,12	.013
	Student	291	85,6	49	14,4	97,60	<0.001		
YT10_Safer than real gun shooting	Lecturer	27	96,4	1	3,6	11,6	<0.001	18,03	.010
	Student	314	92,4	26	7,6	138,24	<0.001		

**Table 3:** Comparison of t-students of factors affecting the excitement of lecturers and students through the application of the MBT-03 shooting machine

Criterion	Objects	N	Levene test		$\bar{X}$	$\pm$ SD	$\epsilon$	t	Sig. (2- tailed)
			F	Sig.					
YT1_Simple to use	Lecturer	28	1,950	,163	4,17	,785	,043	-,269	,788
	Student	340			4,21	,568	,107		
YT2_Rapid practical implementation	Lecturer	28	6,769	,010	4,25	,812	,044	,264	,176
	Student	340			4,07	,604	,114		
YT3_Feeling (trigger force) like shooting a real gun	Lecturer	28	,573	,449	4,07	,871	,047	-,410	,682
	Student	340			4,14	,705	,133		
YT4_Vivid image and sound effects	Lecturer	28	2,018	,156	4,07	,917	,050	-,997	,319
	Student	340			4,25	,645	,122		
YT5_High reliability and accuracy	Lecturer	28	,017	,897	4,00	,857	,046	-2,605	,061
	Student	340			4,43	,634	,120		
YT6_Less affected by weather and climate conditions	Lecturer	28	3,579	,059	3,86	,846	,046	1,570	,117
	Student	340			3,61	,497	,094		
YT7_Convenient layout space	Lecturer	28	,299	,585	4,24	,760	,041	,401	,689
	Student	340			4,18	,723	,137		
YT8_Analysis of mistakes in each key area of the practitioner	Lecturer	28	1,280	,259	4,02	,862	,047	1,818	,070
	Student	340			3,71	,659	,124		
YT9_Store results in PC and print results easily	Lecturer	28	1,186	,277	3,96	,784	,043	1,599	,111
	Student	340			3,71	,535	,101		
YT10_Safer than real gun shooting	Lecturer	28	,646	,422	3,81	,949	,051	,131	,184
	Student	340			3,54	,793	,150		



**Figure 4.** Comparison the average value of factors affecting the excitement of lecturers and students through the application MBT-03 shooting machine at Center for National Defense, HCMUTE

## 5. Conclusion

HCMUTE's National Defense Education Center is fully equipped with military equipment, especially the MBT-03 training machine (07 sets). The study has identified 10 observed variables to assess the interest through practical learning in NDSE, including: YT1\_"Simple operation"; YT2\_"Rapid Practical Deployment"; YT3\_"Feel (force of trigger) like shooting a real gun"; YT4\_"Sound effects, vivid images"; YT5\_"High reliability and accuracy"; YT6\_"Less affected by weather and climate conditions"; YT7\_"Convenient layout space"; YT8\_Analysis of errors in each of the practitioner's key areas; YT9\_"Store results in computer and print results easily"; YT10\_"Safer than shooting a real gun".

After 2 years of practical application of the MBT-03 shooting machine for Defense and Security Education classes, the interest in teaching and learning of lecturers and students through 10 observed variables has been enhanced in the following directions. positive direction. This is the necessary basis for organizing teaching and learning in order to contribute to raising the interest of teachers and learners in the practical course of NDSE.

### Conflict of Interest Statement

All authors declare that they have no conflicts of interest.

### About the Authors

**Nguyen Duc Trong** was born on May 30, 1974 in Quang Binh province, Vietnam. He received his master's degree in Education Management in 2016. Now he works as the Head of Military Department of Department of National Defense Education at Ho Chi Minh City University of Education, Vietnam.

**Nguyen Duc Thanh (PhD)** was born on July 19, 1971 in Vietnam. Associate Professor PhD, Manager of Center for National Defense, Ho Chi Minh City University of

Technology and Education, Vietnam. His research areas are physical education, sports, testing, assessment, and training.

## References

1. "5 Technology applications in teaching today", extracted from viewsonic.com on May 29, 2022 (<https://www.viewsonic.com/library/vi/Giao-duc/ung-dung-cong-listen-in-day-hoc/>).
2. Duong Nghiep Chi (1993), *Sports Measurement*, Sports Publishing House.
3. 3. Pham The Dung (2019), "Some solutions to improve the quality of training in shooting techniques for students majoring in the Center for NDSE of Vinh University", extracted from the website centermgdqpvn March 3, 2019, (<https://trungtamgdqpvn.vinhuni.edu.vn/hoat-dong-chuyen-mon/seo/mot-so-giai-phap-nang-cao-chat-luong-huan-luyen-ky-thuat-ban-sung-cho-birth-vien-chuyen-nganho-trung-tam-gia-duc-quoc-phong-va-an-ninh-truong-dai-hoc-vinh-90350>).
4. Pham Minh Hac (2004), *Some personality research issues*, National Political Publishing House.
5. Nunnally, J. C. (1978), *Psychometric Theory (2nd ed.)*, New York: McGraw-Hill.
6. Duong Thi Kim Oanh (2013), "Some approaches in studying learning motivation", *Journal of Science*, Ho Chi Minh City University of Education, (No. 48), 138-148.
7. Tran Minh Quyen (2014), *Some solutions to improve the quality of teaching and learning AK submachine gun shooting technique for students studying defense and security education at Hue National Defense Education Center*, subject Code : 2013.KGV.02.
8. Pham Thanh Thuy (2009), *Students' interest in studying National Defense-Security Education at Hanoi National University of Education*, master's thesis in psychology, Hanoi National University of Education.
9. Bui Van Trang (2022), "Research and improvement of line-of-sight testing equipment to improve teaching efficiency when practicing Ak submachine gun shooting for students at the NDSE Center of the University of Science and Technology. Hanoi Physical Education and Sports", *Journal of Science Physical Education and School Sports* - No. 4/2022, pp. 26-29.
10. "MBT-03 shooting device", extracted from quansu.vn on 7/7/2010 (<https://www.quansu.vn/index.php?topic=16390.30>).
11. Hoang Trong, Chu Nguyen Mong Ngoc (2008), *Analysis of research data with SPSS - Volume 1*, Hong Duc Publishing House.
12. Nguyen Quang Uan (2005), *General Psychology Textbook*, Pedagogical University Publishing House.

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