



EFFECTIVENESS IN APPLYING SOLUTIONS TO IMPROVE SWIMMING PRACTICE SKILLS OF STUDENT AT THU DAU MOT UNIVERSITY, VIETNAM

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Abstract:

Based on assessing the current situation of teaching and finding feasible solutions to improve students' practical capacity of swimming at Thu Dau Mot University, the paper has assessed the effectiveness of innovatory solutions application. The results indicated that students' health, technical skills and achievement were improved significantly.

Keywords: swimming, solution, capacity, students, practice, Thu Dau Mot University

1. Introduction

Vietnam has more than 3200 kilometers of coastline, more than 3112 large and small rivers (more than 41,000 kilometers in total length of rivers) and many intermingled canals, ditches and canals. [12, 13] That is the reason why the country has a high child death rate from drowning. [1]

In May, 2012, Ministry of Labor, Invalids and Social Affairs announced the results of the "National Injury Survey in 2010". In it, drowning is the leading cause of death for children, with about 4,500 children dying each year. On average, 12 children per day die because of drowning. [2]

In the period of 2015-2017, the situation of drowning deaths in children has decreased compared to the previous period, but there are still about 2,000 deaths per year on average and this is still the leading cause of death due to injury in children. [4]

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Therefore, teaching and learning to swim for high school students to both develop physical and swimming ability and contribute to improve life skills is essential and urgent in human life.

In Vietnam, there are many studies on swimming [3, 5, 6, 7] but in Binh Duong province, there are no works in the field. Binh Duong, due to its geographical location, has a small number of rivers, so the majority of students are unable to swim, so it is difficult to practice swimming skills. For that, how to teach non-swimmers to become good lecturers for most students who cannot swim in a limited time? What should be done to improve the quality of teaching practice of movement techniques while fostering practical teaching skills in general and swimming in particular for lecturers? From all above urgent situations, we found that implementing the research topic: "Effectiveness in applying solutions to improve swimming practice skills of student at Thu Dau Mot University" is very necessary.

2. Methodology

2.1. Participants

Pedagogical experiment is conducted on both subjects who are male students and female students learning specialized physical education and non-specialized at Thu Dau Mot University. In which, 2 experimental groups include of 28 male specialized students and 45 non-specialized female students who learn to swim according to improved solutions; 2 control groups consist of 27 male non-specialized students and 45 female non-specialized students learning swimming by old way.

2.2. Procedures

The study was conducted from January to September 2016 at Thu Dau Mot University, Viet Nam. Experimental period is 1 semester (4 months).

Among 6 proposed solutions, the first 3 ones (consist of Organizing propaganda; Ensuring facilities; Improving lecturers' qualifications) can be applied to both groups of students (Experimental group and Control group). Particularly the last three solutions include of Improving teaching and learning methods; Management and organization of classes; Enhancing extracurricular swimming activities) are the main solutions to applied for Experimental group and showed the difference between improvement teaching methods towards old one. This difference is presented in detail in Table 1.

Table 1: Factors showing the difference between the old swimming teaching method (the control group) and the new way of teaching swimming (experimental group)

Comparison factors	Control group	Experimental group
Teaching method	Tradition; The teacher is the center of knowledge transmission	Improving; The learners is the center of knowledge transmission
Lecturers' role	Unilaterally transmit knowledge	Guiding, suggesting, motivating, advising students' learning activities
Interaction	One way (lecturer → student)	Multidimensional (lecturer ↔ student, student ↔ student).
Class organization	Do not divide groups, organize teaching simultaneously Preaching and modeling actions simultaneously	Dividing class into groups and caring closely about activities of each student through the group Organizing student's activities such as role-playing, observing, self-criticism, evaluating, correcting for themselves and classmates
Method of studying	Listening passively Doing it mechanically Do not prepare lesson at home	Actively participating in giving of opinions to build lessons Arguing and frankly criticize issues Pre-studying documents at home (principles, movement techniques, common errors, remedies, etc)
Teaching facilities	Curriculums and tools are available at the pool	Visual and modern appliances (images, film discs, video cameras ...) to view samples and record them for evaluation and correction
Extracurricular training	Not focused	Practicing overtime, performing physical exercises, working in groups (camera, comment, evaluating errors according to each lesson)

2.3. Measurements

Common methods used in the process of performing research tasks include synthesizing and analyzing relevant documents method; interviewing method; pedagogical testing method; pedagogical experiment method; Statistical and calculation method.

In those methods, pedagogical testing is used to check and evaluate student's general fitness criterion such as 30m print, standing long jumping, running 800m/1500m. Meanwhile, experiment method to assess students' swimming performance in breaststroke and crawl (25m distance).

3. Results

3.1. Current status of teaching swimming at Thu Dau Mot University

3.1.1. The general situation of teaching swimming at Thu Dau Mot University

Survey results were presented in Table 2 show:

Swimming is one of many subjects of the education program, which is undertaken by the Faculty of Physical Education - National Security with the subject of 3rd year students in both specialized and non-specialized education curriculum.

Table 2: Summary of interview opinions on the general working situation of teaching swimming at Thu Dau Mot University

No.	Interview contents	Chosen opinions	Teacher's opinions (n=200)		Student's opinions (n=200)	
			n	%	n	%
1	Duration	≤ 30 periods	22	11	19	9.5
		30-60 periods	117	58.5	131	65.5
		> 60 periods	42	21	32	16
2	Conditions of facilities to teach and learn swimming	Good	20	10	10	5
		Rather	126	63	88	44
		Fair	210	105	234	117
		Poor	44	22	68	34
3	Difficulties in student's swimming learning	Quality of pool	19	9.5	12	6
		Lack of instructor	11	5.5	6	3
		Study documents	9	4.5	14	7
		Tools - equipment	18	9	16	8
		Costly	24	12	24	12
		Fear of injury	22	11	33	16.5
		Afraid of water	41	20.5	36	18
		Diseases	13	6.5	28	14
		Unconfident	42	21	55	27.5
Other reasons	1	0.5	2	3		
4	Equipping swimming skills for students	Very necessary	128	64	76	38
		Necessary	66	33	62	31
		Unnecessary	6	3	36	18
		No idea	0	0	26	13
5	Benefits and effects of swimming	Waste of time	2	1	6	3
		Fresh	33	16.5	26	13
		Vulnerable to injury	6	3	13	6.5
		Physical health training	61	30.5	58	29
		Costly	9	4.5	4	2
		Entertainment	12	6	32	16
		Not important	4	2	6	3
Practical application	74	37	55	27.5		

The content of swimming so far for specialized and non-specialized education students is quite simple, only one type of swimming (breaststroke).

The duration of the whole course is only 30 periods, conducted in 15 lessons, encapsulated in one semester (2 periods/a session/a week). Both students and lecturers have said that these studying durations is quite short, not satisfying the demand for swimming as well as forming good swimming skills which ensure that students can apply fluently after graduation. Most lecturers and students believe that the appropriate time for swimming program is appropriately from 30 to 60 periods.

Facilities for teaching and learning to swim at the university (consist of external linkage facilities) are quite good, can meet professional requirements.

The common difficulty arising from subjective factors of learners is still significant, notably 21% of students and 27.5% of lecturers perceive that due to lack of confidence in learners; 20.5% of students and 18% of lecturers think that learners are afraid of water.

Both lecturers and students are highly aware and attach special importance to the role of swimming. When asked about equipped swimming skills for students, there is up to 97% of lecturers and 38% of students said that "very necessary"; " "; 33% of lecturers and 31% of students said it was "necessary"; The number of lecturers' denial or "no opinion" is negligible (only about 3%). (Figure 1)

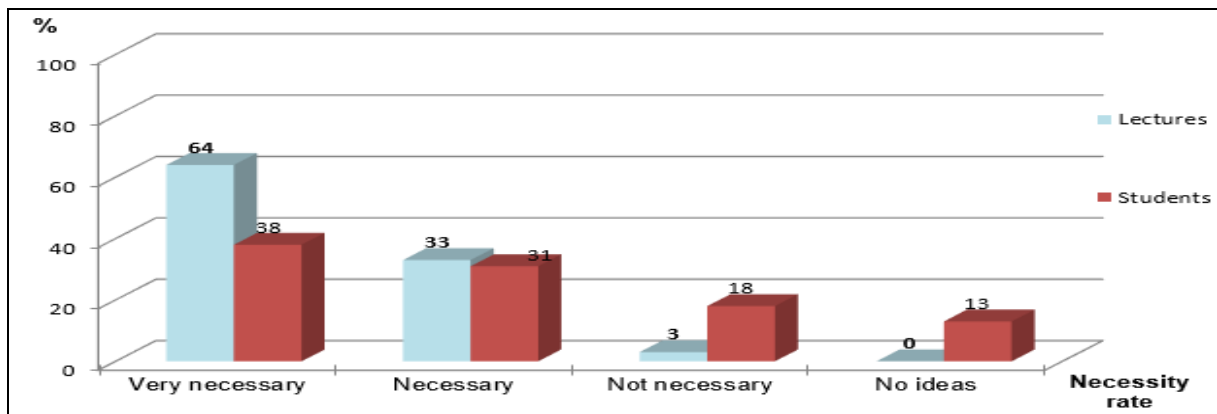


Figure 1: Evaluate the necessity of equipping swimming skills for students

Although there are some differences between lecturers and students's judgment towards swimming role in each criteria, in general, these ideas have similarities in the positive direction that swimming has brought to learners. (Figure 2)

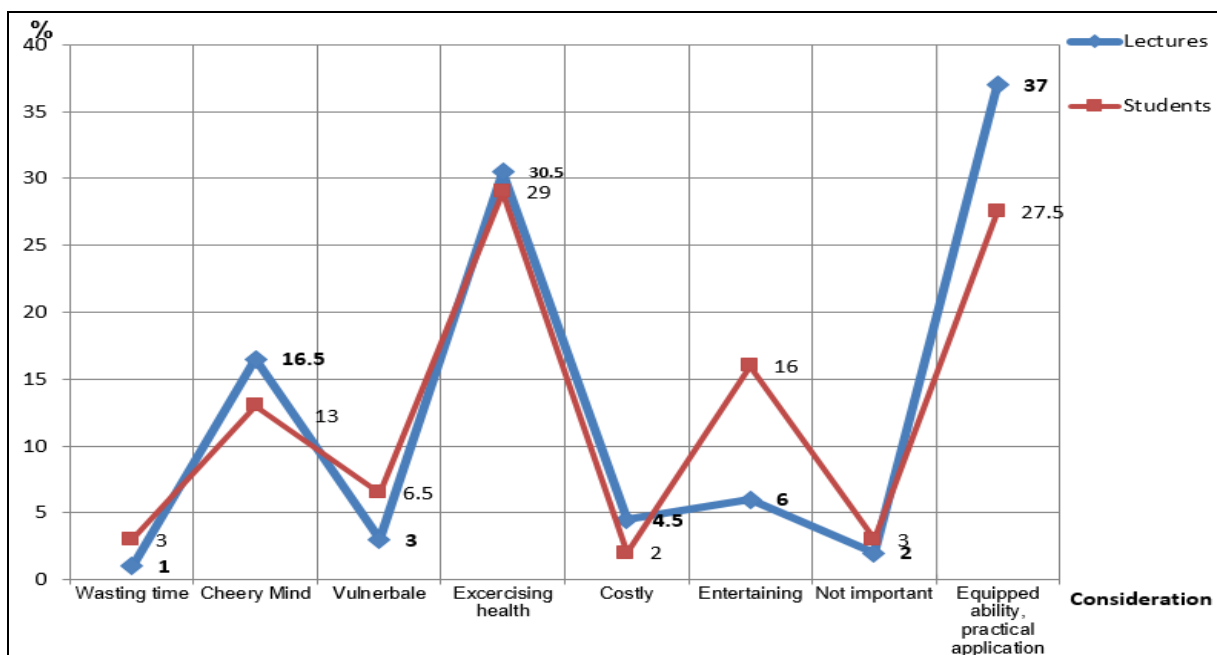


Figure 2: Verification of lecturers and students of Thu Dau Mot University about the effect of swimming

3.1.2. Current status of swimming teaching activities

The research results presented in Table 3 are noted as following:

Swimming lecturers' professional competencies are good for this subject. However, lecturers mainly use the traditional method in class (such as presenting, focusing on the content of the lecture, instructing generally for the whole class, repairing mistakes, personalizing the characteristics of the learner object, etc...). Clearly, these swimming teaching methods have not really shown new points to promote the positive of learners. (Figure 3)

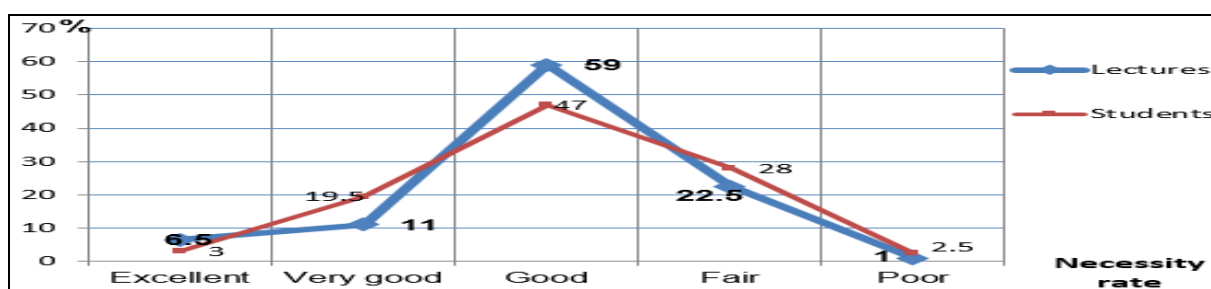


Figure 3: Verification of lecturer's ability in teaching swimming

The results of the interview show that lecturers are mainly using traditional methods that means just giving presentations, focusing on the content of the lecture but rarely changing, expanding the mind, setting the problem, assigning and dividing class into the groups, playing the role so that the students can learn, analyze, evaluate, criticize, solve cases study (opinions of 41.5% of lecturers and 38% of students). In addition, the method of general guidance for the whole class still prevails absolutely but not towards the fault, individual learners (judgment of 48% lecturers and 53.5% student).

- The role of lecturers in swimming class is expressed as unilateral person who has power in class time, and is arbitrary in the role of the teacher, which should have expressed as an instructor, advisor, suggester,... in learners' activities.
- Swimming examination has not yet directed to individual ability of learners, but professional, periodic, not comprehensive and large in scope.

Table 3: Summary of interviews related to the status of swimming teaching methods at Thu Dau Mot University

No.	Interview content	Chosen opinions	Teacher's opinions (n=200)		Student's opinions (n=200)	
			n	%	n	%
1	Teacher's capacities	Excellent	13	6.5	6	3
		Very good	22	11	39	19.5
		Good	118	59	94	47
		Fair	45	22.5	56	28
		Poor	2	1	5	2.5
2	Teacher's method in class	Presentation focuses on lesson content	83	41.5	76	38
		Make a model for learners to see and imitate and	96	48	107	53.5

		follow				
		Grouping, making the case, assigning to learn, solve the case	15	7,5	10	5
		Role-playing	6	3	7	3.5
3	The role of lecturers	Transmitting knowledge unilaterally	90	45	58	29
		Domineering, showing the highest power	63	31.5	93	46.5
		Guiding and suggesting activities for students to self-control their learning content	28	14	26	13
		Encouraging and advising learning activities for students to actively achieve the objectives of knowledge and skills	19	9.5	23	11.5
4	Assessing learning outcomes	Final exam	75	37.5	56	28
		Learning process test	114	57	125	62.5
		Highlights of students in theoretical and practical lessons	7	3.5	11	5.5
		The process of performance and contribution of students throughout the course	4	2	8	4

3.1.3. Current status of swimming learning activities

The results presented in Table 4 show that lecturers have not built a friendly learning environment so that students can be confident, flexible and creative.

Table 4: Summary of interview ideas related to the status of swimming activities at Thu Dau Mot University

No.	Interview content	Chosen opinions	Teacher's opinions (n=200)		Student's opinions (n=200)	
			n	%	n	%
1	Classroom environment	Formalistic	81	40.5	62	31
		Constants, stereotypes are almost unchanged	77	38.5	75	37.5
		Students are self-control and flexible	26	13	24	12
		Intimate and close.	16	8	39	19.5
2	Activities of students in swimming class	Focus on listening, taking notes	113	56.5	74	37
		Remember and repeat	66	33	97	48.5
		Observation, analysis, discussion	14	7	23	11.5
		Finding and research materials in advance	7	3,5	6	3
3	Method of acquiring lessons	Passively listening	73	36.5	65	32.5
		Follow lecturers' instructions mechanically	67	33.5	68	34
		Proactively, actively participate in speaking, building lessons	45	22.5	34	17
		Frankly criticize, debate related issues according to learner's position / viewpoint	15	7.5	33	16.5
4	Independence in learning	Depends on lecturers' lessons content	73	36.5	84	42
		Depends entirely on the contents as well as the teaching methods that are imposed by lecturers	114	57	92	46
		Promoting initiative capacity	9	4.5	11	5.5
		Promoting the ability to criticize and state opinions	4	2	13	6.5

Learning activities of students in swimming class are mainly focused on listening, writing and memorizing many things and repeat what lecturers communicate.

Meanwhile, lecturers don't attach special important to ask learners to observe, brainstorm, role-play, discuss or assign tasks as well as encourage learners to explore and research materials at home.

Students mostly take lessons by listening passively (judgments of 36% of lecturers and 49.5% of students), then follow lecturers' requirements mechanically and lacking in creation (judgments of 51.5% lecturers and 43.5% students).

It is very essential to improve the quality of training comprehensively by promoting learners' independence and autonomy. Interview results from lecturers and students showed that the independence, autonomy, activeness and critical ability of students in swimming classes are not very high or even too passive and dependent entirely on lecturers' teaching methods.

3.1.4. Current situation of teacher-student interaction and knowledge results gained from learning swimming

The interaction between lecturers and students is considered as the key to open successful door in teaching and learning quality in swimming class. Survey results are presented in Figure 4 reflecting:

In fact, the interaction between teachers and students in swimming class is quite faint, mainly one-sided, derived from teachers to students. Meanwhile, there is a lack of feedback between teachers and learners as well as multidimensional impacts (between teachers and learners, between learners and learners).

Swimming lecturers have not focused on guiding students to actively learn, collect, study materials to improve swimming techniques.

As a result, swimming knowledge that students receive from the teachers is academic, mold-based, lack of applicability.

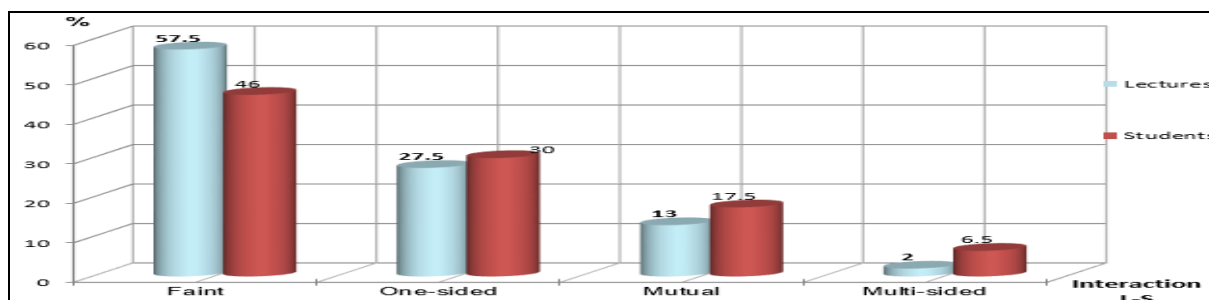


Figure 4: Current situation of interaction between lecturers and students in swimming class

3.1.5. Current status of extracurricular activities and students' needs of practice

The results are also recorded that:

There are not many extracurricular swimming activities are organised for students to improve their practical capacity.

Students have very few chances to participate in extra training courses at the exterior swimming pools.

Student's need to practice extracurricular swimming is real and very high.

3.1.6. Synthesis of the opinions of lecturers and students toward factors that need to be improved to enhance the quality of teaching swimming at Thu Dau Mot University

Summary of the above factors indicates that the current status of teaching swimming is quite inadequate and it is necessary to complement more appropriate innovation solutions.

Table 5: Synthesis the selection of factors to improve the quality of teaching swimming at Thu Dau Mot University

No.	Elements need to be innovated	Lecturers' opinions (n=200)		Students' opinions (n=200)		Comparison	
		n	%	n	%	χ^2	P
1	Swimming pool, auxiliary equipment	12	6	19	9,5	9.49	>0.05
2	Curriculum	43	21.5	24	12		
3	Teaching method	68	34	63	31.5		
4	Lecturers' capacity	27	13.5	29	14.5		
5	Lecturers and students' awareness	22	11	32	16		
6	Extracurricular swimming activities	28	14	33	16.5		

Through analyzing the opinions of two subjects, lecturers and students with the index χ^2 of recognition, there is a similarity in identifying 6 factors (subjective and objective as presented in Table 5) that need improvement to improve the quality of teaching swimming (χ^2 is calculated as (= 9.49) < χ^2 table (= 37.65) with P> 0.05). This is the main basis for making the necessary changes.

3.2. Evaluating of effectiveness of innovative solutions in teaching swimming

3.2.1. Organize the experimental process

After studying the overall situation, the research work has proposed 6 innovative solutions to improve Thu Dau Mot university students' swimming capacity. The purpose of the experiment is to highlight the advantages and the superiority of the improved solutions (which are mainly teaching methods) applied to students (male and female) of experimental group compared to students (male, female) of two control groups. Specifically, role playing method helps students improving their pedagogical ability; Group dividing method and self-correcting help students identifying each other's shortcomings to overcome and improve the movement techniques in the water environment. (It is difficult for lecturers to correct mistakes for each individual in this environment). These positive factors affect toward students' professional results and swimming achievements.

Specific tasks: First, evaluating the effectiveness of new solutions for students in terms of fitness after the course (before and after experiment period). Second, evaluating the effectiveness of new solutions for students in terms of technique (swimming techniques and swimming achievements) after the course.

Experimental results are presented below:

3.2.2. Evaluate the effectiveness of new solutions for students in terms of physical strength (before and after experiment period)

Basically, before the experiment the physical strength between the experimental groups and controlling groups of male specialized in physical education students as well as of female non-specialized in physical education students are similar.

After the experiment period, the result of comparison the physical strength between two experimental groups to 2 control groups presented in Table 6 and Table 7.

A. For male students specialized in physical education: Both the male experimental group and the male control group had physical growth after the experiment period. Horizontal comparing between these two groups found that: only one third of male experiment group's fitness criteria (namely running 1500m) outperformed to male controlled group's with $P < 0.05$. Particularly, median value difference of two criterion (include standing long jumping and 30m print) were not statistically significant with $P > 0.05$. (Table 6)

Table 6: Comparison of physical fitness before experiment period
between male experimental group and male controlled group in specialized education

No.	Targets	Male experimental group (n = 28)				Male control Group (n=27)				Comparison	
		\bar{X}_A	$\pm S_A$	$C_v(\%)$	ϵ	\bar{X}_B	$\pm S_B$	$C_v(\%)$	ϵ	t	P
1	30m print (s)	5.15	0.24	4.66	0.02	5.19	0.26	5.01	0.01	1.6	>0.05
2	Standing long jumping (cm)	225.3	9.75	4.33	0.01	224.4	3.42	1.52	0.01	1.53	>0.05
3	Running 1500m (s)	388.7	9.53	2.45	0.01	390.7	7.33	1.88	0.01	1.95	>0.05

B. For female students not specialized in physical education: There were no significant physical differences between female experimental group and female control group except for the criteria of running 1500m ($d = 5.44s$), the difference in median values was statistically significant with $P > 0.05$. (Table 7)

Thus, it can be noted that, after the experimental period, the physical strength of the male and female experimental groups did not show the superiority of the difference towards male and female controlled groups.

Table 7: Comparison of physical fitness before experiment period
between female experimental group and female controlled group in non-specialized education

No.	Targets	Female experimental group (n = 45)				Female control group (n=45)				Comparison	
		\bar{X}_A	$\pm S_A$	$C_v(\%)$	ϵ	\bar{X}_B	$\pm S_B$	$C_v(\%)$	ϵ	t	P
1	30m print (s)	5.42	0.46	8.49	0.03	5.51	0.6	10.89	0.04	1.68	>0.05
2	Standing long jumping (cm)	172.16	16.79	9.75	0.01	169.4	17.07	10.08	0.04	1.63	>0.05
3	Running 800m (s)	281.1	20.61	7.33	0.01	284.4	25.7	9.06	0.03	1.45	>0.05

3.2.3. Evaluate the effectiveness of new solutions for students in terms of speciality (swimming techniques and swimming achievements) after experimental period

The effectiveness of new professional solutions for students after the course is compared with the following aspects:

- For male specialized in physical education students: involving swimming techniques (number of swimming types) and swimming achievements (calculated according to swimming time - s);
- For female non-specialized in physical education students: involving swimming techniques (number of swimming styles) and swimming achievements (calculated by swimming distance - m).

A. For male students specialized in physical education:

- Regarding swimming techniques: After experimental period, the male experimental group was expert in and well trained both swimming styles (breaststroke and crawl). Meanwhile, the male control group was only well-informed and skillful in only breaststroke.
- Regarding swimming achievement (s): By observing the breaststroke after the experimental period, it was noted that 100% of the students of the male experimental group and the male control group completed entire required distance at the final test (25m). However, in terms of swimming performance (swimming time calculated in second), there is a statistically significant difference between these two groups but the advantage belongs to the experimental group ($t_{\text{calculation}} = 2,38 > t_{\text{table}} = 2$ with $P < 0.05$). Test results are presented in Table 3.13 and Figure 3.26.

B. For female students non-specialized in physical education:

- Regarding swimming techniques: The female control group only practiced one swimming style (breaststroke), while the female experimental group was more fully equipped so after the course the students of this group were able to swim well both popular swimming styles (breaststroke and crawl).
- Regarding the swimming performance (s): Observation of breaststroke-style test results after the experiment period of 2 groups, certified that students in both experimental groups and female control groups attempted to complete the distance according to the requirements of final test (25m) and 100% students

touch and pass 20m distance. But in terms of swimming achievements recorded that, the female experimental group has the number of students completing the swimming range (25m) with a relatively high rate (68%); The number of students achieving the range from 20m to under 25m is 32%; No students have achievements of under 20m.

While the female control group had only 11% completed the distance of 25m; The number of students achieving a range of between 20m and <25m is 17.8%, while the number of students who can only reach the range of less than 20m is 71%. The difference in mean values between these two groups was statistically significant but superior belong to the female experimental group ($t_{\text{calculation}} = 2.62 > t_{\text{table}} = 2$ with $P < 0.05$). Test results are presented in Table 8, Figure 5, Figure 6.

Table 8: Comparison of swimming performance (25m) after the course between Experiment groups and Control group

Object		\bar{X}_A	$\pm S_A$	$C_v(\%)$	ϵ	Comparison		d ($\bar{X}_A - \bar{X}_B$)
						t	P	
Male (s)	Experimental group (n=28)	19.9	1.72	8.64	0.01	2.12	<0.05	-0.91
	Control group (n=27)	20.87	1.82	8.75	0.03			
Female (m)	Experimental group (n=45)	23.27	2.39	10.37	0.04	6.21	<0.001	3.03
	Control group (n=45)	20.24	2.24	11.07	0.04			

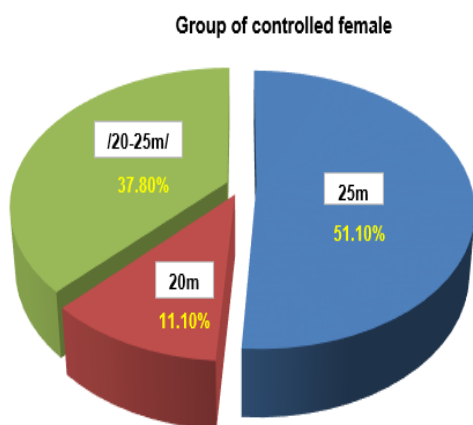


Figure 5: Swimming achievement according to distance of female experimental group

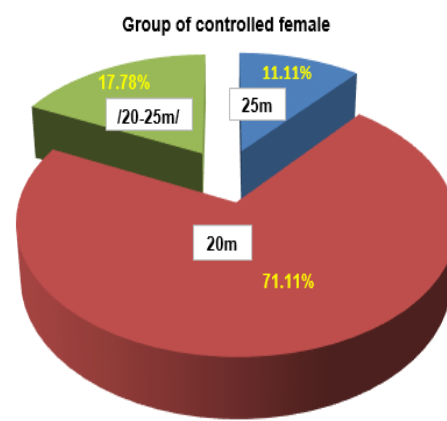


Figure 6: Swimming achievement according to distance of controlled female group

Thus, after the experiment period, regardless of male or female, if they learn swimming according to the new solutions, they all have positively developed in fitness as well as in swimming achievement and technique more than students who learn according to the old method. Thereby, it affirms that the innovative solutions in swimming teaching have shown superiority over previous teaching methods and completely feasible to apply for swimming teaching to students of Thu Dau Mot University later.

4. Conclusion

- Current status of teaching swimming for students at Thu Dau Mot university has many shortcomings that need to be changed such as: content, duration, swimming teaching facilities and obstacles from learners; The main methods of teaching are traditional, not really aimed at promoting the learners more positive; Teacher's role in swimming class is expressed as unilateral person during class time; the current way of examining and evaluating swimming is only about professional, periodic, but not comprehensive and overall, not yet directed to the individual ability of learners; Learning environment is not really friendly and close; Student activities in swimming class are passive, mechanical, lack of creativity, independence, autonomy in lesson construction; Interaction between lecturers and students in swimming class is rather faint, mostly one-sided; Students have not actively studied and collected related documents; Swimming knowledge is academic according to books but lacking in applicability; The student's demand to practice swimming is very high but there are few conditions to participate in extracurricular activities.
- Through studying the inadequacies of the situation, the topic has provided some positive solutions to improve swimming practical capacity of students. They consist of propaganda organizing, enhancing awareness of the significance and role of swimming; ensure facilities and convenience for teaching and learning swimming; improve the qualifications of lecturers; manage and organize the classes effectively; enhance extracurricular swimming activities for students. In particular, the topic pays special attention to improve the teaching and learning methods, which should be emphasized such as role playing method, grouping method so that students can find errors and correct mistakes for themselves.
- Pedagogical experiment has proved the effectiveness and outstanding advantages of new solutions in teaching and learning swimming compared to the old method. Although the physical disparity is not significant, it thanks to the application of innovative learning and teaching swimming solutions which were proposed by the topic that the swimming technique and achievements of experiment groups were better compared to control group after the course.

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