Building Integrated Situations in the Teaching of Probability and Statistics Oriented to Professional Skills for Economic Majored Students – Case Study at Lachong University Viet Nam

Hoan Van Tran and Hang Thuy Nguyen
Lac Hong University
Dong Nai Province, Viet Nam

Abstract. Nowadays, the integration theories are applied to education has become a theoretical view of teaching and learning popular in the world to develop learner's capacity. Teaching methods for integrating practices, impact on the integration of knowledge with the formation and training of skills, this teaching method to facilitate for learners to actively participate and improve practical capacity through integrated learning situations. Probability - Statistics is a subject that has many applications for the economic majors, applications do not only stop at the level that the subject is equipped with basic knowledge to study specialized subjects but also application of knowledge to solve the economic problems set out in practice. Moreover, teaching Probability - Statistics should be geared towards practice professional skills for economics students specified in the learning outcomes. To do this, we researched a number of integrated teaching situations in probability-statistics with other subjects and practical economic situations, to meet the learning outcomes of the economic majors.

Keywords: Learning outcomes; economy; integrated situation; professional skill; Probability–Statistics.

Introduction

Improving quality, innovation in education and training is a vital criterion in today's science and technology for a university. Innovation is an indispensable trend of the times and according to the educational development strategy reported at the 10th National Party Congress. "Educational development is a top national policy. Fundamental Innovation and universally reform Vietnam's education along the direction of standardization, modernization, socialization, democratization and international integration" (Government, 2012).
Lac Hong University is a multidisciplinary, multi-level educational institutions; combine training with scientific research and technology transfer in the areas of engineering technology, economics and the humanities and social. The school

ensure to provide and care the conditions of quality learning for everyone in need of training and retraining; on the other hand ensure to provide human resources have qualifications, expertise and political savvy for the labor market at Dong Nai province in particular , and the country in general. Lac Hong University where manpower training provided directly to the industrial zones, export processing zones at Dong Nai province and the neighboring regions. Therefore, the school has set up training program according to rate of 60% theory and 40% practice and self-study.

In recent years, one of the most important innovation content in Lac Hong University has implement is establish the standard output with high requirement. Standard output represents an affirmation of the ones that the students need to know, understand and be able to do at the end of the curriculum, including the specific requirements: Knowledge, skills, attitude, ability to learn and improve, work placement after graduation (Lac Hong, 2015). However, a big question arises "What occupational skills of the students are equipped and trained how through the process of learning the subjects in the field of basic science and general knowledge?".

Teaching of probability and statistics subject is always a topic of interest to many researchers. Related to this topic, with the learned material, we see three research trends associated with three goals:

- Help students realize intimately intertwined relationship between Probability and Statistics.
- Help learners understand the meaning of the basic concepts of Probability - Statistics.
- Help learners develop statistical thinking.

On the world, with Universities, piece of research of Artigue M. emphasizing the relations between probability and statistics in economics education (Artigue, 1992), and research of Artaud M. (1993) with doctoral thesis "La mathématisation en économie comme problème didactique - Une étude exploratoire" made an analysis about history of mathematics and economics to indicate that the creation of economic knowledge often associated with mathematical investigations, research shows that a close relationship between economics with mathematics, especially with Probability - Statistics theory (Artaud, 1993).

In Vietnam there have been many studies on teaching the Probability - Statistics in College and University, some doctoral dissertation authors, such as Trao Van Phan (2009), Hieu Huu Ta (2010), Tinh Thi Phan (2011), Hoat Tat Ngo (2011), Yen Thi Hoang Tran (2011), Hai Nam Hoang (2013),…. However, the object to which the author is interested in training Maths teacher in the field of Probability - Statistics and to improve the effectiveness of teaching Probability - Statistics for students but no specific research on teaching Probability - Statistics target at occupational skills training for economics students.

For these reasons above, we have done research "Building integrated situations in the teaching of probability and statistics oriented to professional skills for economic majored students at Lac Hong university"

Research methodology

Theoretical method: Analyze, summarize, collect information, research documents, … to establish theoretical foundation of the topic.

Practical method: Method of observation, survey; Method of mathematical statistics: Process surveyed and actual data.

Study results and comments

Introduction to integrated teaching

Integrated teaching concept

Integrated teaching is the teaching process in which the teacher organizes students into teams, create knowledge, skills in many different fields and Many other personal attributes such as strong-willed, co-operation, creativity,… to solve learning tasks through it is the formation and development of qualities and capacity needed (Roegiers 1996, 2004, 2005).

The essence of integrated teaching is teaching theoretical contents combine with lesson practice and behind the hidden, it is a point of view of competence model in education (Allal 2001).

Characteristics of integrated teaching

The purpose of integrated teaching is to take form and develop learner competencies, help learners to solve problems in the practice of life, occupation. The capacity of nature is the ability of the subject to flexibly and reasonable organizes the knowledge, skills, attitude, values, motives to meet the complex requirements of an operation, ensures that the activity is successful in a certain context (situation); and the method of creating that capacity is integrated teaching. Integrated teaching has the following characteristics (Roegiers 1996, 2004, 2005), (Gerard & Roegiers, 2003):

- Establish relationships, according to a certain logic of knowledge, different skills to perform a complex operation.
- Select the information, knowledge and skills that students need to perform practical activities in learning situations, to integrate them into the world of life.
- Make the learning process clear and purposeful.
- Teachers do not prioritize the teaching of knowledge and single information, but students must be able to search, manage, and use knowledge to solve problems in meaningful situations.

- Overcoming the habit of communicating, absorbing discrete and discrete skills make people "functional illiterates", meaning that they can be crammed with much information but cannot be used. As such, integrated teaching is reform to reduce unnecessary knowledge, to increase in useful knowledge. To select the content that is included in the curriculum, first answer what knowledge is needed and can make students aware of meaningful situations. Expression of capacity is knowing how to use the content and skills in a meaningful situation, not in discrete knowledge (De Ketele, 1996, 2004).

Creating an integrated teaching situation

In teaching, to develop capacity in an integrated perspective, it is necessary to build a system of practical situations (Roegiers 1996, 2004, 2005), (Su, 2005). The way to build an integrated situation is:

- First of all, what is the need to identify situations to help develop competencies for learners?
- Each construction situation needs to meet the following requirements:
    + Contains problems.
    + When dealing with problems, they must apply different knowledge and manipulate personal qualities.
    + Close to life, occupation of the learners.
    + The situation can be resolved.
- Situation systems toward will help develop the necessary capacity.
- System of integrated situations to be satisfied:
    + Each situation helps to develop some capacity
    + A Chain of situations is designed so that developmental capacities tend to rise the level of that capacity. (However, Not all capacities are satisfied. "In the following situations, that capacity must be at a higher level than in the previous situation. Sometimes the following situations just need to make sure the requirement to "strengthen" that capacity is available) (Bonniol, 1985), (Wu & Adams, 2006).

The role and status of the probability and statistics teaching in comparison with the economic majors's learning outcomes

The contents in the learning outcomes of economic majors under the CDIO (Crawley et all, 2005) approach

One of the most important jobs done at Lac Hong University is to develop the learning outcomes of the CDIO approach of each training discipline. After many edits, up to now the learning outcomes of the school was completed with the comments of many enterprises, departments and agencies in the area. From the mission of the school and the annual surveys, the school built "the learning outcomes 2016" (Benken 2005), (Crawley et all, 2005), (Lac Hong 2015), (Hoan & Trung 2016):

1. **KNOWLEDGE AND SPECIALIZED ARGUMENTS**

1.1. BASIC SCIENCE KNOWLEDGE

1.1.1. Knowledge of the basic principles of Marxism-Leninism; Vietnam Communist Party's Revolutionary Platform; Ho Chi Minh Thought;

1.1.2. Have basic knowledge of mathematics and natural sciences;

1.1.3. Have knowledge of social sciences and humanities.

1.2. BASIC KNOWLEDGE AND SPECIALTY CORE KNOWLEDGE

1.2.1. Knowledge of fundamental principles for analyzing activity in the economy, to grasp the policy issues related to the overall performance of the economy, to find out some solutions to achieve the goals of the organization.

1.2.2. Basic knowledge of corporate governance, marketing, and economic law helps leaders make decisions to achieve the goals of the organization.

1.2.3. Basic knowledge of Econometrics: Probability and statistics, Linear programming,… applied to build linear programming situations to solve real problems in business to bring out optimal production options for businesses.

1.2.4. Knowledge of construction, estimating, the econometric model tests used in the analysis, economic forecast, finance.

1.2.5. Basic knowledge about international business as well as international investment has understood the factors affecting international business operations, the opportunities as well as challenges in the current trend of globalization like regulations and the importance of international investment in international economic integration.

1.2.6. Basic knowledge of accounting theory: concepts, nature, functions, objects, purposes and requirements of accounting, accounting methods, the process of collecting, recording accounting data, accounting sequence, major business processes, forms of accounting, content and organizational forms of accounting work, as well as the preparation and interpretation of financial statements.

1.2.7. Knowledge of the organization of the accounting apparatus in various types of enterprises (production, commercial, administrative careers, bank,…) as well as the accounting data processing skills of economic operations arising from the organization.

1.2.8. Basic knowledge of English for economics as well as writing, speaking and reading skills in knowledge economic growth in business.

1.2.9. Fundamental knowledge of monetary finance in general and corporate finance, in particular to take forming new thinking on monetary finance as well as corporate finance to approach, to implement policies and economic policy guidelines in reality.

1.2.10. The basic knowledge about how to use math tools in financial operations to carry out a financial instruments valuation, analyze projects, and select investment projects help managers make the right decisions in business to achieve high economic efficiency.

1.3. BASIC KNOWLEDGE AND ADVANCED MAJORS

2- SKILLS, PERSONAL QUALITIES AND OCCUPATIONS

2.1 ARGUMENTS THINKING AND SOLVING ECONOMIC PROBLEMS

2.1.1 Detect and form problems

2.1.2 Generalize the problem

2.1.3 Skills in qualitative assessment and analysis of the problem

2.1.4 Problem analysis skills when lack of information

2.1.5 Quantitative analysis skills

2.1.6 Problem-solving skills

2.1.7 To take solutions and recommendations

2.2 RESEARCH AND KNOWLEDGE DISCOVERY

2.2.1 Form the hypothesis

2.2.2 Search and synthesis of documents

2.2.3 Experimental studies

2.2.4 Hypothesis testing

2.2.5 Ability to apply research in practice

2.2.6 Skills in collecting, analyzing and processing information

2.3 SYSTEMS THINKING

2.3.1 Whole thinking /logic

2.3.2 Detect problems and correlations between problems

2.3.3 Identify priority issues

2.3.4 Analyze the choice between problems and find a balanced solution

2.3.5 Multi-dimensional analysis thinking

2.4 SKILLS AND PERSONAL QUALITIES

2.4.1 Ready to take the lead and cope with risks

2.4.2 Patiently

2.4.3 Flexible

2.4.4 Confident

2.4.5 Laborious

2.4.6 Enthusiastic and passionate about the work

2.4.7 Creative thinking

2.4.8 Critical thinking

2.4.9 Understand and analyze the knowledge, skills, qualities and attitudes of another individual

2.4.10 Discover and learn from life

2.4.11 Manage time and resources

2.4.12 Adaptive skills with the complexity of reality

2.4.13 Understanding of different cultures

2.4.14 The spirit of honor

2.4.15 Study skills and Self - study

2.4.16 Self management skills

2.4.17 Computer skills

2.5 PROFESSIONAL SKILLS AND QUALITIES

2.5.1 Professional ethics (honest, responsibility và credible)

2.5.2 Professional behavior

2.5.3 Planning skills for careers in the future

2.5.4 Organizational skills and job arrangements

2.5.5 Recognize and catch up with the modern world economy

2.5.6 Ability to work independently

2.5.7 Confidence in the international working environment

2.5.8 Target skills

2.5.9 Motivational skills to work

2.5.10 Personal and career development skills

2.5.11 Customer and partners care skills

2.5.12 Skills in use english for specific

3- SKILLS AND QUALITIES BETWEEN INDIVIDUALS (SOCIAL SKILLS)

3.1 WORK IN GROUPS

3.1.1 Create effective teamwork

3.1.2 Group operations

3.1.3 Group development

3.1.4 Team leader

3.1.5 Working skills in different groups

3.2 COMMUNICATION

3.2.1 Communication strategy

3.2.2 Communication structure (how to argue, arrangement ideas.)

3.2.3 Communication skills documents

3.2.4 Communication skills through email / media

3.2.5 Presentation skills

3.2.6 Communication skills among individuals

3.3 COMMUNICATION IN FOREIGN LANGUAGES

3.3.1. English (Equivalent level B1 according to European standard or TOEIC 450).

Thus, this learning out comes is stated that the content of probability and statistics knowledge should equip students in economic majors to meet the learning outcomes. 1.1.2; 1.2.3; 1.2.4; 1.2.10. Beside the content of knowledge, the probability and statistics teaching can be towards training skills in the learning outcomes, such as: 2.1.6. Problem-solving skills; 2.2.5. Ability to apply research in practice; 2.2.6. Skills in collecting, analyzing and processing information; 2.4.7. Creative thinking; 2.4.8. Critical thinking; 2.4.15. Study skills and self study; 2.4.17. Computer skills; 3.1. teamwork skills; 3.2.5. Presentation skills,…

The above analysis confirms that for the teaching of probability and statistics to meet the knowledge and skills in the learning outcome built up, teaching should be equipped toward the knowledge of probability and statistics to apply in economics and students can use in studying the next module as well as learning to improve after graduation and application in economics. Not only that, the probability and statistics teaching towards skills training mentioned in the learning outcomes.

The role of probability and statistics in the learning outcome of the economic majors

Probability and statistics is a basic subject and today, knowledge of this field has penetrated into almost every field and science. Knowledge about scientific probability as well as statistics have been widely applied (Devore 2004). This is one of the basic knowledge of the module that the Ministry of Education and Training has defined as a compulsory subject for students in economics, medicine, chemistry and the environment.…

The characteristic of probability and statistics is "finding stability in the seemingly unstable, indispensable in the randomness by mathematical methods" (Hayter, 2007), (Devore 2004). Incident is an indispensable part of life. Probability and statistics becomes an important science subject, especially its applications. In fact, individuals sometimes encounter situations in front of multiple choices before deciding, the exact decision will lead they to success. Probability statistics is necessary, It is an indispensable tool when economists need a basis to make the final decision on their business strategies (Hayter, 2007).
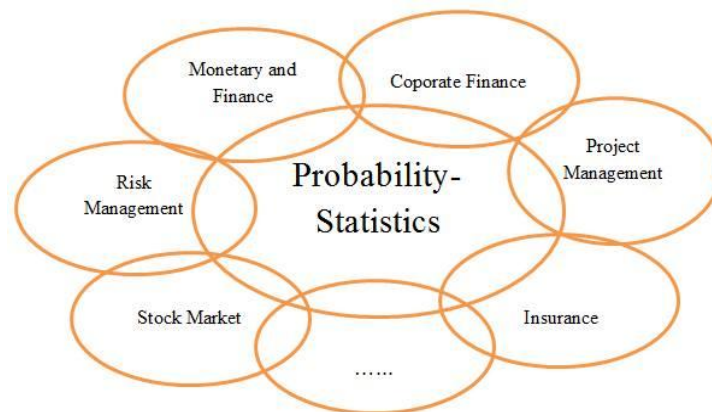
Figure 1. Relationship between probability statistics and subjects of the economic majors

Probability statistics equips economists, future engineers in the process of collecting and processing information. It is a prerequisite to other subjects such as Corporate Finance, Econometrics, Stock Market, Risk Management, Insurance,...

Moreover, with particular applications in Mathematics should be training of basic mathematical skills such as: generalizations, especially, modeling, detect and solve problems... Learning probability and statistics is also contributing to training the occupational skills associated with economics students, such as: gathering skills, statistical data processing; observation skills; analytical skills, decisions through estimation problems, accreditation; skills in information technology applications; teamwork skills… These skills are an indispensable part of the requirements for occupational skills for economics students that "Learning outcomes" of Lac Hong University was set out. But, how to teach probability and statistics to contribute to meeting the learning outcomes in Lac Hong University is still a question without answers.

For these reasons above, we have done research "Training occupational skills through teaching probability – statistics for economic majors "

Reality of teaching probability and statistics subjects to the requirements of the learning outcomes at Lac Hong University

In (Hoan, 2014) have pointed out that, teaching of probability and statistics at school exist on limitations the following:

The practice of problem-solving skills have not shown more in the lectures. Most lecturers taught in the traditional way is mainly (cognitive knowledge and application of knowledge to solve specific exercises), leading to not practice problem solving skills for students.

Don't focus on assessment with practical subject contents. Example for the tests, final exams have many properties of mathematics and applied to all majors, without the installation practical problems for students in specific occupations.

No application of information technology in teaching an effective. At present, most instructors only instruct students to compute by pocket calculator without using the tool as a specific software (such as Maple, Mathematica,…) for solving specific math problems like technique for students

Not to promote self-learning ability, ability to work collectively of students through group exercises, assignments homework. Now, the school has not compiled the major assignments of the subject, resulting in the training of the above skills not yet implemented for this subject.

This reality led to the final examination results module of probability and statistics is low, the number of students retake a test, repeat a module is high. Moreover, the majority of students said that this is a difficult subject and not the application-oriented subject for his/her specialized subjects as well as training skills through this course. This is most evident in assessment of student for teachers in the subject. For example, the content of questions, such as: 1) Lecturers provide references to students by setting many problems related to the subject; 2) Lecturer held for student group activities; and 3) Your comments about the quality of teaching in this course. With selected items for students: a) Totally disagree; b) Disagree; c) No comments; d) Agree; and e) Totally agree, the students' answers are usually c: No comments.

Thus, teaching probability and statistics acccording to results of the survey (Hoan, 2014) is not meet the requirements set forth in the school's learning outcomes. Specifically, in criteria such as:

The content of probability and statistics is general knowledge, theoretical heavy, not directly applied to economic majors.

Teaching is not organized towards of training professional skills for students as defined in the learning outcomes

The integrated teaching method allows the selection of content into curriculum and can make students apply their knowledge to specific job situations. On the other hand, knowledge is also equipped to train the skills in a meaningful situation, not just to equip the knowledge discrete.

The above analysis shows that research is needed "Give some integrated situations in teaching of probability and statistics oriented to professional skills for the students economic majors at Lac Hong University" is very necessary requirement.

Some integrated situations in the teaching of probability and statistics oriented to professional skills for students economic majors
Some practice skills for students through teaching situations are (Roegiers 1996, 2004, 2005; Hoan, 2015; Hoan & Hang, 2016; Schoenfeld, 1992).
- Skills in using mathematical language
- Skills in modeling a practical situation
- Problem-solving and decision-making skills

- Application research skills in practice
- Skills in collecting, analyzing and processing information

To solve the problem contained in the situation, students must apply the following knowledge:

- Knowledge of probability and statistics: random variables, probabilities in the classical sense, probability and statistics, expectations, variance of random variables,…

- Basic knowledge of economics, such as risk measurement, optimal coverage, utility function, expected return E(R), risk, balances…

Situation 1. Apply probability and statistics to solve the problem of insurance

Exercise. Suppose you have a motorbike worth 10 million VND. A company invites you to buy insurance with the following conditions: Every year, you pay a certain premium, if you lost the car, the insurance company will reimburse you 8 million (equivalent to 80% of the value of the car). How much is the highest premium you accepting? Now, suppose you read the People's Police Newspaper and know that in the past year, the rate of motorcycle theft in the city was 0.1% (that is, with 1000 motorcycles, 1 motorcycles was stolen). How does this new information affect the decision on the maximum premium you accept?

Problem situation, given: A person thinking how to protect personal property?
The solution that most people accept is to buy insurance for their motorcycles. However, whether buying or not buying insurance, he still faces the risk of being stolen. So, what to do to minimize losses, This question directs students to task the mathematical expectations model to calculate the expected level of expected holdings of all possible cases. We have to compare between two cases: When to buy insurance and not to buy insurance?

Table 1. Cases of insurance fees

Insurance	Lost (p = 0,1%)	Not lost (p = 99,9%)	Expected asset value (E (X))
Yes	0 million	10 million	(99,9%). 10 million
No	(0,1%). 8 million	10 million	(99,9%) 10 + (0,1%) 8 million

Thus, if you buy insurance, expected asset value to be:

$EV_1 = (99,9\%).10(\text{million}) + (0,1\%).8(\text{million}) - IF$, with IF is insurance fees. If not, buy insurance, expected asset value is:

$EV_2 = (99,9\%).10(\text{million}) + (0,1\%).0 = (99,9\%).10(\text{million})$. So, if only based on the level of expectations to make decisions, you will buy insurance if $EV_1 > EV_2$, it means IF < 8.000 VND. This fee is 8.000 VND called fair premium after performing all these calculations, we try to ask ourselves again what is the maximum premium we can accept? And if the premium is not 8,000VND but 10,000VND, are we willing to buy insurance?

From a real situation in class, It is possible to draw some initial comments related to the problem for students as follows: Why do we buy insurance (demand for insurance)? We buy insurance to reduce variability in consumption. Note that you only need to spend 8,000 VND a year you are not afraid of empty hands when losing a motorcycle anymore. Thus, variability or variance is one of the measures of risk. In statistics, people use the variance to measure the variability of a random variable. "Variability" here means that the variance of the mean (or expected value) (Thoyts, 2010).

Starting from the practical problem, students can ask questions: Will the company always sell the desired amount of insurance? The rate of theft this year increased over last year?,... Therefore, the insurers themselves are also at risk when carrying out insurance projects above. What do they do to minimize the risks they will face? This is precisely the premise for students to enter into new, expanded and inherited models of mathematical and new economic model, broader and inheritance of probability models was built from Application of probability and statistics, such as: profit, risk, risk measurement, risk mitigation, profit maximization, the application of choice in business,...

Situation 2. Apply probability and statistics of calculating the expected return on financial investment (Integrate with the stock market subject and Corporate Finance) (Hallwood & Ronald MacDonald, 2010)

Exercise. Mr. An works for a company with a monthly cumulative of 30,000,000 VND and is considering two investment channels as follows:

- Option 1: This amount will be deposited into the bank with a stable interest of 1,800,000 VND/year.

- Option 2: Investing in a stock market of 100,000 VND to buy a stock will receive an annual dividend of 5,000 VND/year and after one year, expected market price of that stock is 105,000 VND.

This is the result Mr. An obtained after collecting data, using calculations (which in fact, many investors use Probability models) to process the data..

Problem situation, given: Which strategy is optimal?

Consider plan A: If Mr.An deposited money in the bank and then earn 1.800.000 VND/year, it means rate of profit equal to 1.800.000/30.000.000 = 6%/year.

Consider plan B: If Mr.An invested in securities, his investment information as follows:

- The investment amount is 100,000 VND

- Income after 1 year of investment is: 5.000 + (105.000 - 100.000) = 10.000/ stock (this is Stock market subject)

- Rates of profit = 10.000/100.000 = 10%/year

Thus, if you invest in the stock, the return on investment includes stock dividends (5,000 VND/stock) and income from securities increased (5,000 VND/share), with Mr.An's 30 million VND can buy 300 stocks and earn

respectively 3,000,000 VND (300 stock x 10,000 VND/stock) (this is Business finance subjet)

Therefore, in terms of margins to evaluate the efficiency of investment, we choose option 2, which is to invest in stocks, the yield will be higher. However, the risks of the two options are different. If Mr. An deposited into the bank will have a profit of 6% per year. If Mr. An buys stock and holds until the end of the year, he may or may not have the expected dividend as the stock price may fluctuate up or down, so Option 2 to suffer a loss. In terms of the degree of risk, it is clear that depositing money in a bank can not be considered as risky, but if investing in stocks, the probability of stock price volatility is higher. This shows that the choice of higher expected value always has a higher risk, that is, the expected return and risk are two variable quantities in the same direction. This problem continues to be covered in detail in the subjects: Economics of Investment, Choice Uncertainty,...

Situation 3. Application of probability and statistics to solve the problem of choosing a business plan (Integration with Management Accounting subjects) (John Burns at all, 2013), (Moore & McCabe, 2006)

Exercise. At HAT company, there are data on the results of business operations in accordance with the balance of receivables in November 2016 as follows: (consumption of 4,500 products), Unit: 1,000 VND

Table 2. Data on the results of business operations in accordance with the balance of receivables in November 2016 At HAT company

	Total	Calculated for 1 product	Rate
1. Revenue	300.000	60	100%
2. Variable cost	225.000	45	75%
3. Contribution margin (CM)	75.000	15	25%
4. Fixed cost	25.000		
5. Profit	50.000		

December, executives want to increase profits over the previous month, so they have offered to reduce selling price by 2,000 VND/product and increase the cost of advertising on the media by 8,000,000 VND (this is Management accounting subject). So, the question is put: Will the proposed management plan become feasible?

Problem situation, given: Is the proposed management plan feasible?

Before the situation, Financial analysts conduct calculations of probabilities happens when put this plan into the business model of the company. To do that, they conduct a market survey and assume that after studying the market survey results of the sample survey at some business agents when implementing the above plan, as follows: Consumption is expected to increase from 20% to 50%, with the probability that consumption increase by 20% is 60%, the probability that consumption will increase by 50% is 40%.

From the results of the probability survey, the accountant can calculate the profit (loss) corresponding to the survey results:
- If consumption of products increase by 20% then:
    + Unit Contribution margin = (60.000 - 2.000) - 45.000 = 13.000 VND/product.
    + Increased receivables: (5.000 x 120% x 13.000) – 75.000.000 = 3.000.000 VND
    + Profit increased: 3.000.000 – 8.000.000 = -5.000.000 VND (Profit decreases 7.000.000 VND)
- If consumption of products increase by 50% then:
    + Increased receivables: (5.000 x 150% x 13.000) - 75.000.000 = 22.500.000 VND
    + Profit increased: 22.500.000 – 8.000.000 = 14.500.000 VND
Inferred, the increase in profitability when calculating is: -5.000.000x60% + 14.500.000x40% = 2.800.000 VND (Profit increased 2.8 million VND).
The results show that the proposed management model can bring additional profits for the company. Thus, the company should implement this option.
In the above situation, students realize that conducting surveys and collecting data by application of probability and statistics model allows the enterprise to verify the feasibility of a business plan from which to make the decision. Should the business plan be implemented?

Research results and survey

Content, methods, evaluation aims and object of surveying
With the aim of evaluating the effectiveness of the application of teaching methods towards occupational skills training for students through these integrated situations in the teaching of probability and statistics, after impact methods with the lecturer about integrated situations in charge of subject, we conducted a survey on the subject is first year student of Faculty of Finance and Accounting and Faculty of International economic business, Lac Hong University, school years: 2015 to 2016. Votes have clear data to use for statistics in the survey was N = 152.
Research methodology, at the time survey: Information and Documentation Center of Lac Hong University conducted a survey on student course evaluations after students semester exam in that subject, the survey was carried out through the website.
Tools and content assessment survey: Questionnaire for the survey includes 20 questions with level scale: 5 = totally agree, 4 = agree, 3 = no ideas, 2 = disagree, 1 = totally disagree.

Survey results
Survey findings are taken from Information and Documentation Center of Lac Hong University (Here only lists of questions related to skills-table 3).

Table 3. Course evaluation results of Probabilily and Statistics courses of students in academic year 2015 - 2016

Ordinal	CONTENT SURVEY	STUDENT'S COMMENTS				
		1	2	3	4	5
1	During school hours, Teacher guides for students: using mathematical language and modeling a practical situation	0	0	7	135	10
2	During school hours, Teachers guides for students: using mathematical tools to solve practical problems	1	2	9	130	10
3	During school hours, Teachers focus on developing: problem-solving skills and decision-making skills of students	0	1	7	126	18
4	Lesson content connects with the real life, in association with future career majors	0	3	7	132	10

Survey results show that the majority of students agree with the comments set out, in there the rate agree and totally agree, high in the critical comments related to teaching towards skills training in standard learning outcomes. Specific question No. 1: "During school hours, Teacher guides for students: using mathematical language and modeling a practical situation" have 95.39% students, question No. 2: "During school hours, Teachers guides for students: using mathematical tools to solve practical problems" have 92,1% students, question No. 3: "During school hours, Teachers focus on developing expression skills, problem-solving skills and decision-making skills of students" have 94,74% students choice answers are agree and totally agree. This insists that these integrated situations in the teaching of probability and statistics have contributed to the teaching of subjects respond to standard learning outcomes, as well as contact with the practical applications for job from Probability – Statistics course.

Conclusions

Thus, creating integrated situations in the teaching of probability and statistics has initially oriented teaching for economics students in order to purpose of training professional skills.

The results initially showed that students learn probability and statistics in a more positively, in particular the ability to apply probability and statistics to solving occupational issues has been significantly improved. That helps us have a well-founded, synchronized goal, the content and method of teaching associated with vocational training to achieve the developmental learning outcomes.

References

Allal, L. (2001), *La métacognition en perspective, in Figari, G., Achouche, M. (2001). L'activité évaluative réinterrogée.* Regards scolaires et socioprofessionnels, Bruxelles : De Boeck Université, p. 142-145.

Artigue M. (1992), *"Ingénierie didactique" Recherche en didactique des Mathématiques*, La Pensée Sauvage, Grenoble.

Artaud M. (1993), *La mathématisation en économie comme problème didactique-Une étude exploratoire.* Thèse pour l'obtention du grade de docteur de l'Université d'Aix-Marseille II. Marseille: IREM d'Aix-Marseille.

Bonniol, J.-J. (1985), *Influence de l'explicitation des critères utilisés sur le fonctionnement des mécanismes de l'évaluation d'une production scolaire.* In Bulletin de Psychologie, XXXV, 353, p. 173-186.

Benken J., Crawley F. et all (2005), *Benchmarking Engineering curricular with the CDIO syllabus*, Int. J. Engng Ed. Vol. 21, No.1, pp.121-133

Burns J., Martin Quinn, Liz Warren, Joao Oliveira (2013), *Management Accounting*, Mcgraw-Hill higher Education.

Crawley F. (2001), *The CDIO Syllabus A Statement of Goals for Undergraduate Engineering Education*, Department of Aeronautics and Astronautics, Massachusetts Institute of Technology.

De Ketele, J.M. (1996), *L'évaluation des acquis scolaires : quoi ? pourquoi ? pour quoi ?*, Revue Tunisienne des Sciences de l'Éducation, 23, p. 17-36.

De Ketele, J.-M. & Gerard, F.-M. (2004), *La validation des épreuves d'évaluation selon l'approche par les compétences*, Mesure et évaluation (à paraître).

Devore L. (2004), *Probability and statistics for engineering and the sciences*, sixth edition, Thomson, USA.

Goverment (2012), *Education Development Strategy 2011 – 2020*, Decision No. 711 / QD - TTg dated 16 - 06-2012, Ha Noi.

Gerard, F.-M. & Roegiers, X. (2003), *Des manuels scolaires pour apprendre*, Bruxelles : De Boeck Université.

Grangeat, M. (1998), *Régulation métacognitive, transfert de connaissances et autonomisation*, Educations, n°15, p. 37-40.

Hayter A.J. (2007), *Probability and statistics for engineering and the sciences*, third edition, Thomson, USA

Hoan V. T. (2014), Situation of teaching Probability - Statistics subject versus outcomes at Lac Hong University, *Ho Chi Minh City University of Pedagogy, Journal of Science*, 59(93), p.165–169.

Hoan V. T. (2015), Some measures to train problem-solving skill through teaching probability – statistics for economic majored students at Lac Hong University, *Hue University, Journal of Science*, Vol. 105, No. 6.

Hoan Van Tran & Hang Thuy Nguyen (2016), Teaching Probability – Statistics towards Training, Occupational Skills for Economic Majored Students – Case Study at Lac Hong University Viet Nam, *International Journal of Learning, Teaching and Educational Research*, Vol. 15, No. 12, pp. 130-144, November.

Hoan Van Tran & Trung Van Nguyen (2016), *Approach CDIO in teaching of probability and statistics for students economic majors at Lac Hong University oriented to meet the learning outcomes, Proceedings of national CDIO conference*, Publisher The National University - HCM city.

Jadoulle, J.-L. & Bouhon, M. (2001), *Développer des compétences en classe d'histoire.* Louvain-la-Neuve : Unité de didactique de l'Histoire à l'Université catholique de Louvain.

Lac Hong University (2015), *The report of the implementation of public regulation at Lac Hong university in 2015 - 2016 academic year.*

Moore DS, McCabe GP. (2006), *Producing data in Introduction to the Practice of Statistics*, 5th ed. New York, NY: W.H. Freeman and Company; pp. 191–250

Noël, B. (2001), *L'autoévaluation comme composante de la métacognition : essai d'opérationalisation, in Figari, G., Achouche, M. (2001), L'activité évaluative réinterrogée.* Regards scolaires et socioprofessionnels, Bruxelles : De Boeck Université, p. 109-117.

Paul Hallwood, Ronald MacDonald (2010), *International Money and Finance*, Wiley-Blackwell publisher.

Roegiers X**.** (1996), *La Pédagogie de L'intégration ou comment développer des compétences à L'ércole?*, publisher Education.

Roegiers X. (2005), *L'évaluation selon la pédagogie de l'intégration - Est-il possible d'évaluer les compétences des élèves?*, Alger: UNESCO-ONPS.

Roegiers X**.**, (2000, 2e édition 2001), *Une pédagogie de l'intégration*, Bruxelles : De Boeck Université.

Roegiers X**.**, (2003), *Des situations pour intégrer les acquis*, Bruxelles : De Boeck Université.

Roegiers X**.**, (2004), *L'école et l'évaluation*, Bruxelles : De Boeck Université

Schoenfeld A. H. (1985), *Mathematical problem solving*, San Diego: Acadermic Press.

Schoenfeld A. H. (1992), Learning to think mathematically, Problem solving, metacognition and sensemaking in mathematics, in D. A. Grouws, a curadi, *Handbook of Research on Mathematics Teaching and Learning*, New York, Macmillan, pp. 334-370.

Su Viet Nguyen (2005), *Vocational education - The Situation and Solutions*, publisher Education.

Thoyts R. (2010), *Insurance Theory and Practise*, Routledge publisher.

Wu, M., Adams, R. (2006), Modelling Mathematics Problem Solving Item Responses Using a Multidimensional IRT Model, *Mathematics Education Research Journal*. Vol. 18, No. 2, 93-113.

---The end---

Full name of the author 1: Hoan Van Tran
Degree: MSc degree
Address: Lac Hong University - Dong Nai Province
PhD student at Viet Nam Institute of Educational Sciences (VNIES) - specialization: theory and methods of teaching mathematics. Phone: 0973.851.989
Email: tranhoan.math@gmail.com

Full name of the author 2: Hang Thuy Nguyen
Degree: MAc degree
Address: Lac Hong University - Dong Nai Province
Phone: 0937967099
Email: nth2299@gmail.com