Anale. Seria Informatică. Vol. XIV fasc. 2 – 2016
Annals. Computer Science Series. 14ᵗʰ Tome 2ⁿᵈ Fasc. – 2016

9

Assess ICT Competences in Teaching of Teachers and Trainee Teachers at Highland North Vietnam

Trinh Thanh Hai [1], Trinh Thi Phương Thao [1], Tran Trung Tinh [2]

[1] Thai Nguyen University, Thai Nguyen city, Vietnam
[2] National Institute of Education Management

Corresponding author: Tran Trung Tinh, tinhtckh@gmail.com

ABSTRACT: This paper study and assess ICT competences in teaching of teachers, trainee teachers at highland North Vietnam.

KEYWORDS: ICT, learning outcomes, high school, assessment competency, mathematics teaching methods.

1. INTRODUCTION

Vietnam has been investing in integrating Information and Communications Technologies (ICT) in education for several years. However, little is known about teachers' perceptions about ICT integration in education. This study examined teachers' competences about the use of ICT tools for mathematics teaching, administration, professional development and personal use. In Vietnam, mathematics teachers are prepared at two major levels, the college and university levels. In the college level, graduates from university of education are trained as teachers for high schools.

ICT are being integrated in the teaching-learning process in many learning institutions of the world. (Steel 2009, Ismail et al. 2010) It has been learnt that the integration of ICT in education, inter alia, does promote autonomous learning, curriculum differentiation; ([Mva11]) state that, successful integration of ICT in the teaching-learning process, among other things, is dependent on the preparation of teachers.

2. RESEARCH PROBLEM AND DISCUSSION

This research examined the mathematics teachers' perceptions about ICT tools for teaching, professional development, administration and personal use. This was based on the assumption that successful personal use of ICT is likely to motivate the mathematics teachers to use ICT in teaching.

Teachers are an important ingredient in the implementation of ICT in education. Without the involvement of teachers, most students may not take advantage of all the available potential benefits of ICT on their own. Teachers need to actively participate in using ICT. They have to be trained in the use of information technology and in its integration in classroom activities to enhance thinking and creativity among students. They must also learn to facilitate and encourage students by making them responsible for their own learning. The teachers have to upgrade their skills regularly, if they want to stay abreast of developments in their profession and to remain confident in their application of the technology ([Rah08]). See ICT as a tool to revolutionize learning, produce richer curricula, enhance pedagogies, lead to more effective organizational structures in schools, and produce stronger links between schools and society and to empower learners ([BB07]).

All students trained by teacher training colleges or universities have to take at least one course in ICT or computer education. After the completion of those courses, do the trainee teachers feel confident in using ICT in the classroom? To address this, a study was conducted of Ministry of Education and Training Vietnam ([Hai04]) and ([Tha13]) to assess the confidence level of teachers in the use of ICT in teaching.

2.1. The current status of teachers' ICT competencies in high schools in Vietnam

We investigate cases of 193 teachers at high schools in Vietnam.

Table 1. Teacher's training university in Vietnam

No.	Training University	No. of teachers
1	Hanoi National University of Education	22
2	Xuan Hoa University	24
3	Vinh University	11
4	Hong Duc University	8
5	VNU University of Education	6
6	Tay Bac Education	30
7	Thai Nguyen University	92
	Total	193

To improve teaching and learning strategies for teachers, building programs for developing teaching competence must focused on enhancing teachers' to use ICT as a tool. Teacher education is perceived as the critical factor for success in integrating ICT in education ([DS98]). ([AA08]) identify three strategies for an efficient teacher training: to describe digital competence as an important goal/measure; to include it in whole school development; to provide experience of blended professional learning for teachers.

The results of a national survey in Vietnam's pedagogical universities which teach Informatics showed that it consists of some main sections 1) General Informatics, 2) Computer programming language, 3) high-level computer programming language,... students had been being trained to use the Internet, Microsoft Word, Microsoft PowerPoint, Violet software, Lecture Maker software,... at universities.

Table 2. Forms of competences training via using ICT in teaching

No.	Forms of competences training	Total	Percentage
1	Studying at the university of education	54	27.98
2	Regularly training courses for teachers	61	31.60
3	Self study via documents, internet, peers	78	40.42

2.2. Current status for using ICT in teaching

We investigated 194 mathematics teachers at high schools in some provinces (Thanh Hoa, Thai Nguyen, Bac Giang, Hoa Binh, Lao Cai, Lang Son, Cao Bang, Bac Kan, Ha Giang) in Vietnam. We get following results
- Forms of teaching via using ICT (Table 3).
- Forms of using software in teaching (Table 4).
- Forms of using internet in teaching (Table 5).
- Causes that affect the application of ICT in teaching (Table 6).

Table 3. Forms of teaching via using ICT

No.	Forms of teaching	Number of users	Percentage
1	Design lesson plans using Microsoft Word	162	83.94
2	Design lesson plans using Powerpoint	51	26.42
3	Design lesson plans and questionnaires using Violet.	35	18.13
4	Using certain software for subjects	57	29.53
5	Using online teaching software	8	4.16

Table 4. Forms of using software in teaching

No.	Forms	Number of users	Percentage
1	Using slideshows in class	96	49.74
2	Help students solve problems	23	11.90
3	Questionnaires	41	21.20
4	Haven't use teaching software	62	32.12

Table 5. Forms of using internet in teaching

No.	Forms	Number of users	Percentage
1	Finding information about general education	121	62.70
2	Referee lesson plans on internet	84	43.50
3	Extracting information from Internet for teaching session	35	18.13
4	Sharing lesson plans	18	9.32
5	Finding suitable software	57	29.53
6	Using Internet in classroom	8	4.15
7	Designing websites to communicate with pupils.	12	6.22

Table 6. Causes that affect the application of ICT in teaching

No.	Causes	Total	Percentage
1	Abilities to apply ICT are weak	92	47.67
2	Lack of encouragement from school	23	11.90
3	Designing lesson plans is time consuming	46	23.83
4	Unable to find suitable software	31	10.06
5	Don't have efficient teaching methods using ICT	87	45.08

Remarks:
ICTs are seen as tools to help teachers create more 'learner-centric' learning environments.

In Vietnam, research consensus holds that the most effective uses of ICT are those in which the teacher, aided by ICTs, can challenge pupils' understanding and thinking, either through whole-class discussions and individual/small group work using ICTs. ICTs are seen as important tools to enable and support the move from traditional 'teacher-centric' teaching styles to more 'learner-centric' methods.

However, very few teachers typically have a comprehensive knowledge of the wide range of ICT tools and resources. This suggests that teacher inexperience and skill deficiencies may often be an

Anale. Seria Informatică. Vol. XIV fasc. 2 – 2016
Annals. Computer Science Series. 14th Tome 2nd Fasc. – 2016

11

important factor inhibiting the effectiveness of ICT use in education by students.

2.3. Assess teachers' ICT competencies in teaching

2.3.1. ICT competencies in teaching

According to circular 03/2014/TT-BTTTT, March 11, 2014 of Ministry of Information and Communications of Vietnam, "Skill Standards for Information Technology" includes: understanding ICT; using computers; documents processing; using spreadsheets;…

We suggest that teachers need following core ICT competencies:

1. Designing lesson plans using ICT: using computer; extracting information from Internet; designing slideshows,...

2. Using ICT in class to: expressing ideas; choosing appropriate topics; choosing and using software, resources;...

3. Using ICT in assessment: managing classroom activities; assessing, examining...

2.3.2. ICT competencies assessment in teaching

We are living in a constantly evolving digital world. ICT has an impact on nearly every aspect of our lives - from working to socializing, learning to playing. The digital age has transformed the way young people communicate, network, seek help, access information and learn. We must recognize that young people are now an online population and access is through a variety of means such as computers, TV and mobile phones. Many teachers use ICT to support traditional learning methods. ICT allow for a higher quality lessons through collaboration with teachers in planning and preparing resources ([***02]); ICT encourage independent and active learning, and students' responsibility for their own learning ([Pas99]) ICT proves that students who used educational technology felt more successful in school they are more motivated to learn more and have increased self- confidence and self-learning.

In order to assess ICT competencies in teaching, we suggest the following steps:

Step 1. Specify competences to be assessed, for example: basic knowledge; teaching skills; using ICT in specific teaching situations. Furthermore, we need to consider learning attitudes and self-learning ability.

Step 2. Design lesson plans, exams in which teachers and students express their competencies by reports, works, attitudes... So that they can prove their skills and knowledge in learning and teaching.

Step 3. Assessment works best when its purpose is clear, and when it is carefully designed to fit that purpose. Dr. Lorna Earl and Dr. Steven Katz ([E+06]) state that assessment for learning is designed to give teachers information to modify and differentiate teaching and learning activities. It acknowledges that individual students learn in idiosyncratic ways, but it also recognizes that there are predictable patterns and pathways that many students follow. It requires careful design on the part of teachers so that they use the resulting information to determine not only what students know, but also to gain insights into how, when, and whether students apply what they know. Teachers can also use this information to streamline and target instruction and resources, and to provide feedback to students to help them advance their learning.

Step 4. Saving assessment results (in summary). These results provide students and their parents or guardians with accurate competence descriptive feedback to further their learning. It also help teachers adjusting, developing students' ICT competences.

- *Last year students' ICT competence assessment results (before internship)*

We built some tools to assess ICT competences of 4th year students in Vietnam. For example, to choose appropriate teaching resources, we propose 4 levels:

Level 0: Students have no concept of appropriate resources, unable to use well.

Level 1 (Identification): Students be able to identify resources, have certain criteria on resources (such as accurate, visual, simulation,…)

Level 2 (Choosing resources): students be able to choose appropriate resources using ICTs.

Level 3 (Apply effectively): Students be able to choose effective resources for lesson plans, such as multimedia resources, additional e-books, new ideas for lesson plans,...

We conducted an experiment at an university of education in Thainguyen (there are 63.5% students living in northern highland of Vietnam, many are of the local ethnic groups). The year 2012-2013 (Courses 45): We assessed 64 students. The year 2013-2014 (Courses 46): We assessed 96 students. The year 2014-2015 (Courses 47): We assessed 22 students.

Table 7. Student's competence to choosing appropriate resources for lesson plans

Year	End of Chapter II (5th week)				End of Chapter III (8th week)				End of Chapter IV (11th week)				End of Chapter V (14th week)			
	levels				Levels				levels				levels			
	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
2012-2013 (64 students)	12	48	4	0	5	31	23	5	0	13	37	14	0	4	37	23
2013-2014 (96 students)	36	42	18	0	11	27	42	16	4	12	51	29	1	3	57	35
2014-2015 (22 students)	4	17	1	0	1	6	12	3	1	4	10	7	0	2	14	6

Table 8. Student's competence to using supporting software

Year	End of Chapter II (5th week)				End of Chapter III (8th week)				End of Chapter V (14th week)			
	Levels				levels				levels			
	0	1	2	3	0	1	2	3	0	1	2	3
2012-2013 (64 students)	27	30	7	0	9	29	17	9	0	6	37	21
2013-2014 (96 students)	31	47	16	2	11	36	35	14	2	14	48	32
2014-2015 (22 students)	7	13	2	0	2	7	9	4	0	5	12	5

Remarks for Table 7:

If outcome standard is level 2 then there are 94.5% of students satisfied; If outcome standards is level 3, their are 35.1.5%.

Remarks for Table 8:

If outcome standard is level 2 then there are 85.1% of students satisfied. If outcome standard is level 3, there are 31.8%.

- *Teachers' ICT competence assessment results*

We specified some criteria and proposed these following levels:

Level 0: Unable to design lesson plans using ICT.

Level 1 (Low level): Able to design lesson plans using ICT but not very effective.

Level 2 (Middle level): Able to design lesson plans using ICT but mostly using simple applications (Microsoft Office) for show.

Level 3 (High level): Able to design lesson plans using ICT effectively. Mostly teachers use ICT in class.

Level 4 (Expert level): Able to design very effective lesson plans using ICT in which, inspired pupils joining class activities to discover knowledge and master skills...

We conducted a survey which involve interviewing 261 mathematical teachers, in which 193 from 6 northern provinces in Vietnam and 68 masters (courses 17, 18, 20, 21, 22) in University of Education, Thai Nguyen. We get the results in Table 9.

Table 9. Survey results

Levels	Quantity	Percentages
Level 0	39	14.94
Level 1	71	27.20
Level 2	68	26.05
Level 3	51	19.54
Level 4	32	12.26

Remarks:

There are 14.94% do not meet requirement, mostly elderly teachers and/or teaching in poor areas.

57.85% meet the standard (level 2 above), mostly in cities and developed regions.

3. CONCLUSIONS

As technology becomes more and more embedded in our culture, we must provide our students with relevant and contemporary experiences that allow them to successfully engage with technology and prepare them for teaching after school.

It is widely recognized that students are motivated and purposefully engaged in the learning process when concepts and skills are underpinned with ICT pedagogy.

(1). There are many teachers at northern highland of Vietnam are at low levels.

(2). We need to build and implementing frameworks of future teachers ICT competences.

Anale. Seria Informatică. Vol. XIV fasc. 2 – 2016
Annals. Computer Science Series. 14th Tome 2nd Fasc. – 2016

13

(3). Supporting students and teachers' ICT competence at university, Vietnam.

(4) Assessing the development of teachers' competences

Measures to assess the development of teachers' competences are important because they:

- can raise teacher's awareness of the need to develop her or his competences;
- can support a transformation in teaching culture and practice;
- permit the recognition of the (new) competences acquired or developed;
- play a part in the quality assurance and control of training and development, thereby leading to its improvement and helping to achieve excellence;
- can help to develop trust in the teaching workforce; and
- can facilitate timely intervention to improve teaching.

REFERENCES

[AA08]   **John Anderson, Roger Austin** - *E-schooling: Global Messages from a Small Island Chapter 2. An integrated strategy for ICT in schools.* Taylor & Francis eBooks, 2008.

[BB07]   **J. Baggaley, T. Belawati** - *Distance education technology in Asia.* Lahore: Virtual University of Pakistan, 2007.

[DS98]   **N. Davis, M. Selinger** - *Connecting the learning society, National Grid for Learning consultation paper.* Response to the UK government. From the Association for Information Technology in Teacher Education, 1998.

[E+06]   **Lorna Earl, Steven Katz et al.** - *Rethinking classroom assessment with purpose in mind.* Western and Northern Canadian. Protocol for Collaboration in Education. ISBN 0-7711-3478-9, 2006.

[Hai04]   **Trinh Thanh Hai** - *Research topic at ministerial level*, code B2004.

[Hai13]   **Trinh Thanh Hai** - *Research topic at University level*, code 2013-TN.

[HT16]   **Trinh Thanh Hai, Tran Trung Tinh** - *Some Teachers' Technical in Assessing Pupils' Learning Mathematics Process in Vietnam.* Annals. Computer Science Series, 14th, Tome 1, 2016, pp. 30-34.

[Mar07]   **Robert J. Marzano** - *The art and science of teaching: a comprehensive framework for effective instruction.* 2007.

[Mwa11]   **Alcuin Mwalongo** - *Teachers' perceptions about ICT for teaching, professional development, administration and personal use,* International Journal of Education and development using Information and Communication Technology (IJEDICT), Vol. 7, Issue 3, 2011. pp. 36-49.

[MPM94]   **R. J. Marzano, D. Pickering, J. McTighe** - *Assessing Student Outcomes: Performance Assessment Using the Dimensions of Learning Model.* Alexandria, VA: Association for Supervision and Curriculum Development, 1994.

[Pas99]   **D. Passey** - *Strategic evaluation of the impacts on learning of educational technologies: Exploring some of the issues for evaluators and future evaluation audiences.* Education and Information Technologies, 1999.

[Rah08]   **Bakar Ab Rahim** - *Teaching using information and communication technology: Do trainee teachers have the confidence?* International Journal of Education and Development using ICT, 2008.

[SL09]   **C. Steel, M Levy** - *Creativity and constraint: Understanding teacher beliefs and the use of LMS technologies. In Same places, different spaces.* Proceedings ascilite Auckland 2009.

[Tha13]   **Trinh Thi Phuong Thao** - *Research topic at University level*, code 2013-TN, 2013.

[***02]   **OFSTED** - *ICT in schools: Effect of government initiatives. Progress report April 2002.* Office for Standards in Education, London, 2002.