

**Teaching students who are gifted in the natural
sciences and mathematics to study literature:
a practitioner research project**

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INTRODUCTION

The Vietnamese secondary education system, particularly since the overthrow of the colonial powers and the reunification of the country in 1975, has been influenced by the education model of the former Soviet Union but there is now a growing recognition of the need "to renovate the existing curriculum". This paper reports a small scale action orientated study carried out in a highly selective high school that educates "gifted and talented" young people aged from 16-18 years in the provincial city of Da Nang in coastal central Vietnam.

Although it is a requirement of the Vietnamese national curriculum the study of literature is not popular amongst gifted and talented science and mathematics students who prefer to study the subjects they specialise and excel in. Parents often share this view

RESEARCH QUESTION

How can we improve the teaching and learning for students who are gifted in the natural sciences and mathematics in the study of literature?

CONTEXT

EDUCATION IN VIETNAM

Vietnam is a multi-ethnic, multi-lingual society, culturally a blend of Buddhism and Confucianism. The country was dominated by the northern neighbour, China, until the mid-19th Century when the French imposed colonial rule. The Confucian influence is, however, significant. Historically learners memorized the content of books in preparation for the imperial examinations. Contemporary commentators argue that this explains why teaching and learning at all levels has long been and continues to be examination-orientated (Yong Zhao 2011 Pg96). The French influence placed a greater emphasis on science and languages but the elitism remained. The Soviet influence, post-unification, emphasized a narrow specialization in the curriculum.

Since 1986 Vietnam has undertaken economic reforms not unlike those that have been implemented in neighbouring China; essentially a shift from a centrally planned economy towards the adoption of a market economy. The result has been rapid economic growth averaging 8% pa since the millenium and considerable inward foreign investment including hi-tech manufacturers like Canon, Samsung, Hon Hai and Intel (Hayton 2010). The economic growth has exposed major weaknesses not only in the country's infra-structure but also in it's education system. The economic reforms have been used as a rationale for a move away from an elite model of education towards a mass model - the

country shows impressive increases in enrolments at primary, secondary and tertiary levels since 1990. However, since 2005 the encouragement of an educational elite has been enshrined in law with special provision for gifted and talented learners – again a legacy of the Confucian and French education traditions.

The influence of Confucianism should not be under-estimated. Yong Zhao (2011) argues persuasively the affect on Vietnamese students: education is seen as a “meal ticket” and a mechanism for upward social mobility. The curriculum emphasizes theoretical learning, arguably at the expense of practical application and experience.

The current Vietnamese curriculum was introduced in 2000 but was not implemented in the upper secondary school until 2006/7. It aimed at making significant changes:

- The curriculum should ensure all-round education, with balanced development of moral, intellectual, physical and aesthetic abilities, and basic skills, especially vocationally oriented skills.
- The curriculum should have content that is fundamental, simplified, practical and up-to-date. In particular, the curriculum should be practical and strongly relevant to the context of Vietnam, reach the regional and international level, ensure proportional ratios between subjects on science and social/humanities, and provide integrated teaching and learning.
- The curriculum should ensure the implementation of innovative teaching and learning methods which would allow a shift from the one-way transfer of knowledge and skills – “the teachers read and the students write down” paradigm- to a form of teaching and learning where the learning activities of students become more active, and their thinking competencies are encouraged.
- The curriculum should have the highest level of uniformity throughout the country, in particular it should include relevant standards of knowledge, and skills to be learned, and at the same time should consider specific and unique features of local provinces and regions.

(Vu Trong Ry 2005)

The curriculum also proposed changes to assessment:

- Assessment should not focus only on the level of mastering of the knowledge and skills of students
- Assessment should take into account the developmental levels of students
- Assessments should not be conducted only by teachers. Self-assessment by students and peer assessment among students should also be encouraged.
- New assessment techniques that ensure higher levels of objectivity and reliability should be encouraged.

(Vu Trong Ry 2005)

But change has been slow. Nguyen (2006) attributes this to the “inadequate implementation conditions” such as the limited capabilities of teachers, insufficient teaching hours, poor school infra-structure and equipment.

Characteristics of Vietnamese education:

- Memorisation of factual information in preparation for examinations
 - Uncritical acceptance of knowledge transmitted from the teacher
 - Teachers role is didactic, to impart knowledge
 - Students are required to internalize what is taught regardless of its usefulness
 - Students show little interest in group work or teamwork; critical thinking and problem-solving activities
 - Students are diligent and adaptive but lack flexibility
 - Students tend to look for perfection and are therefore fearful of failure
 - Qualifications are more important than the quality of education
- (Adapted from Saito and Tsukui (2008) and Tuong Lai (2000))

Nguyen (2002 Pg4) summarizes this well:

(Vietnamese learners) are very traditional in their learning styles: they are quiet and attentive, good at memorizing and following directions, reluctant to participate (though knowing the answers), shy away from oral skills and from group interaction; they are meticulous in note-taking; they go “by the book” and rely on pointed information, and regard the teacher as the complete source of knowledge.

THE RESEARCH SITE

School intake:

The high school educates students age 16 to 18. Every year, the school enrolls approximately 300 students to the following subjects (2013 – 2014):

Gifted in mathematics:	70	Gifted in literature:	25
Gifted in physics :	50	Gifted in history:	10
Gifted in chemistry :	35	Gifted in geography:	10
Gifted in informatics :	20	Gifted in English:	40
Gifted in biology:	35	Gifted in French :	05

Students gifted in natural science subjects are, therefore, 57% of the total number of students.

The school selection process comprises two rounds:

Round 1: review of the academic and moral records of students.

Round 2: selected students from round 1 take an examination in which they have to complete 4 tests in mathematics, Vietnamese literature; a foreign language (English or French), and the main subject of the gifted class that they intend to enrol in. Marks of the three previous subjects are counted with a coefficient 1 whilst the marks of the gifted subject has a coefficient of 2.

The school's mission and aims:

Currently there are no written aims or statement of mission. However, there is widespread informal knowledge about the school. Its most important function is to prepare high quality human resources for the city. Thus, the school's implicit goals include:

- To educate and train students for international and national academic contests;
- To prepare students for entry to prestigious international and national universities;
- To nurture and preserve the moral qualities of each student.

Schooling:

Students attend normal classes every morning except Sunday. These classes are strictly based on the national curriculum. Gifted classes are held 2 afternoons each week. Special classes for preparing students for national academic contests vary, but are mostly arranged in the afternoon. Afternoon is also the time for sports, gymnastic and art classes.

The school has a boarding house which has been open for 2 years.

Implementation of the national curriculum:

The current national curriculum is divided into two levels of study: fundamental and advanced. Students of the school choose the textbooks determined by the subject groups they belong to. For example: the mathematics, physics and chemistry textbooks for students from the gifted group of mathematics must be at advanced levels, other subjects are at fundamental levels. This research paper focuses on the students who study the fundamental literature curriculum. From a teaching and learning perspective, teachers in the school have more autonomy and can be flexible in the way they plan and deliver their lessons. The rationale

for this is because the students are intelligent and academically focused, very aware of their own achievements.

The learning style of the students in this study:

The students in this study are gifted in mathematics; physics and informatics. A significant feature of these classes is that the number of boys is higher than girls. The following data covers school year 2012 – 2013:

Class 10A1 (Gifted in maths, 16 years old): total 35 students, 24 boys and 11 girls.

Class 10A2 (Gifted in maths, 16 years old): total 34 students, 16 boys and 18 girls.

Class 10A3 (Gifted in physics, 16 years old): total 25 students, 17 boys, 8 girls.

Class 10A5 (Gifted in informatics, 16 years old): total 20 students, 16 boys, 4 girls.

It is possible that this gender characteristic has effects on the motivation to study. Moir A. and Moir B., cited by Gilbert (2002, p. 32 – 33), claims that “Males and females are drawn by the biases of their brains to learn in different ways and to have different interests and enthusiasms and any educational system that insists that that boys and girls are the same, and must therefore be treated the same, is set to do damage.” Thus, Gilbert (2002, p.33) poses and answers a question: “What does this mean for motivation in your classroom? For a start, make sure you have female-type learning opportunities – cooperative, collaborative, language-based – as well as male-type learning – competitive, physical, emotional, with an emphasis on symbols and things.” In this situation, when male – type learning seems essential due to the greater number of boys, the girls still play a significant role in classroom because they often volunteer to answer questions and share their views and feelings in literature classes. There is also a tacit knowledge that girls are better at studying literature than boys, because they are more open in expressing their feelings: It is believed that the standards that constitute a good essay is a combination of “reasons and emotions”. Teachers tend to search for emotional expressions throughout students’ work to judge whether students pour their hearts into it or not. The common word that features in much feedback in students’ literature work is “dry”, which means “little emotion”. Is there a subtle bias against boys in literature classrooms? This study has sought to avoid that bias.

From a teacher’s perspective, the students from these classes have a learning style that shapes their perception of literature. Cottrell (2008; p. 59) describes the “logician learning style” that includes characteristic such as: “you like things to make sense; you like to know the reasons behind things; you are organised in your approach to study; you enjoy tackling complex problems; you are a perfectionist.” The first, second and fourth characteristics are the most recognised features among the students of this study.

Besides issues of gender and group characteristics, social and family pressure has been placed on the students. Students are required to participate in contests and examinations, and their goals are not only to have passed but to have achieved high marks and to have won prestigious titles in local, national and international contests. During many conversations, parents state their views and efforts in orienting their children to pay attention to their main subjects, especially in the case of students gifted in natural sciences, because it is widely believed that students gifted in these disciplines have more opportunities in finding prestigious universities and better jobs. To some extent, these interventions affect students' perception of literature. Even though literature is officially recognised as one of the most important subjects in the curriculum, it does not have the status for the students of this study.

The above mentioned elements contribute to students' attitude towards the study of literature. Bright, academically focused, but in general, the students are not enthusiastic about studying literature. They show a reluctance to write essays and answer questions. Their issues with literature study can be summarised as the following:

- They find it difficult to express their thought or feelings transparently and succinctly in words. This problem is revealed throughout their essays and some mentioned it during interviews.
- They have difficulty transferring their learning from one situation to another, they find it difficult to analyse new material.
- The length of essays has become a challenge, since the students encounter problems in generating ideas and do not have an adequate knowledge base in literature topics.
- They do not understand the conventions for referencing. Plagiarism, deliberate or not, is a common error often identifiable in the students' essays.

RESEARCH DESIGN

The enquiry is essentially practitioner based research carried out in a country where such approaches are in their infancy. Practitioner based research has its roots in seminal work by Stenhouse (1975) advocating the teacher-as-researcher model. He saw the approach as having 3 key elements:

- The commitment to systematic questioning of one's own teaching as a basis for development.
- The commitment and the skills to study one's own teaching
- The concern to question and to test theory in practice (pg143).

Further contributions have emphasised the relationship between practitioner research and critical reflection, the systematic study of professional practice, practitioner control and ownership of research (Elliot 1991; Cochran-Smith and Lytle 1993; Zeichner and Noffke 2001)

In Vietnam, whilst there is a recognition for the need to reform the curriculum, change approaches to teaching and learning and to improve assessment, little attention has been paid to the relationship between improving educational practices and encouraging teachers to engage in practitioner enquiries in order to bring about change. In Western Europe, North America and Australasia, however, there is a growing body of evidence that suggests that by engaging in practitioner research teachers

- gain a better understanding of their practice and ways to improve it (Dadds and Hart, 2001);
- examine theories that are part of educational practice;
- can make significant contributions to public knowledge e.g. Hart et al, 2004;
- engaging in this type of research and enquiry gives teachers an enhanced sense of the student's perspective in the classroom (McLaughlin & Black Hawkins, 2004);
- results in a renewed feeling of pride and excitement about teaching and in a revitalised sense of oneself as a teacher (Elliott, 1991; Dadds and Hart 2001; Zeichner, 2003; McLaughlin & Black Hawkins, 2006);
- reminds teachers of their intellectual capability and the importance of that capability to their professional lives;
- allows teachers to see that the work that they do in school matters;
- reconnects many of the teachers to their colleagues and to their initial commitments to teach;
- encourages teachers to develop an expanded sense of what they can and ought to do.

(Adapted from Campbell A 2007)

This study was seen as an opportunity to carry out a small scale educational action-oriented enquiry that would have benefits for the learners and for the teacher-researcher.

The research involved two phases:

PHASE 1:

The aim of Phase 1 of the enquiry was to obtain data about the students' reading activities.

The teacher asked students in 2 classes of mathematics, 1 class of physics and 1 class of informatics a set of questions about their reading activities. The questions were arranged in the following order:

1. Do you read books on mathematics?
2. Have you ever read any literature?
3. Do you read any newspaper?
4. Do you use online resources?
5. Do you read comics?

The students who showed interest gave more details about their reading activities. The teacher asked further questions in order to clarify their favourite books and the number of the books they read.

PHASE 2:

The aim of Phase 2 was to improve the motivation of the students when studying literature. This was done by the teacher making changes in classroom assessment and teaching approaches.

Traditional literature tests in classroom are often designed around one topic requiring students to undertake tasks including analysing a character from a story or their perceptions about a poem in their text books. While that appears to be a fair way to assess their knowledge and skills, it also creates a passive learning style because students tend to learn – by – heart the notes that they took from the lessons and then write what they memorised rather than their own thoughts. Therefore, the teacher designed a different test containing questions that allowed students to develop their literature skills such as summarising, comparing, identifying the key issues and analyses. The new test was based on new material that was not from the text book, had not been read by the students before, but had the same literature genre and similar features to the material in the text book. Due to the use of the new material, the students could not memorise or plagiarise. This also created more challenges and competition between the students. Before the test, the teacher asked the students to review the skills they employed when reading the similar literature material in their text books. After the test, the teacher interviewed the students in order to elicit their judgments. When it was not possible to interview the students, the teacher-researcher made notes based on her observations of the class.

Regarding the teaching approaches, the teacher worked with the students to identify and clarify the purpose, relevance and methods of the lesson before covering content. That gave the students a sense of transparency and coherence as well as a rationale for the new approach. A case study was carried out in which the teacher used the comparative method in reading an important literature material. The teacher also invited other colleagues to attend the class.

The impact of the lesson was evaluated by using an unstructured focused interview with 3 students who were available for interview during a break period and semi structured interview with 3 colleagues who had attended the class.

DATA ANALYSIS AND FINDINGS

PHASE 1: STUDENTS' READING ACTIVITIES

Notes:

Class 10A1 (Gifted in math, 16 years old): total 35 students, 24 boys and 11 girls.

Class 10A2 (Gifted in math, 16 years old): total 34 students, 16 boys and 18 girls.

Class 10A3 (Gifted in physics, 16 years old): total 25 students, 17 boys, 8 girls.

Class 10A5 (Gifted in informatics, 16 years old): total 20 students, 16 boys, 4 girls.

Question 1: Do you read books on your main discipline?

All of the students from the 4 classes answered yes to the question. Students from class 10A1 and 10A2 (Gifted in Mathematics) showed enthusiasm for reading books on mathematics. Some students from class 10A3 (Gifted in Physics) said they had been told that reading physics books was necessary in order to achieve success in contests. Students from class 10A5 said that they read documents given by their informatics teacher.

Question 2: Have you ever read any literature?

Class	Number of students who answered yes to the question out of total number students
10A1	33/35
10A2	27/34
10A3	24/25
10A5	8/20

10A1: 2 students claimed they had not read books on literature at all. One of the two is the best mathematic student in the class, but his performance in literature is not producing high grades.

10A3: Students stated that they read Chinese and French fiction that were recommended by peers or by their parents. Two students in this group said they read Vietnamese poems.

10A5: Students who read books on literature revealed that they enjoyed work by Nguyen Nhat Anh, a best selling author on teenager fiction.

Question 3: Do you read any newspapers?

All of the students from these 4 classes said yes to the question. While most of students from classes 10A2, 10A3 and 10A5 enjoyed reading teenager magazines, students from class 10A1 chose more mature publications.

Question 4: Do you use online resources?

Again, the response from all of the students was positive. The websites that they often visit are online newspapers for teenagers and sport news.

Question 5: Do you read comics?

Class	Number of students answer yes to the question out of total number students
10A1	6/35
10A2	32/34
10A3	23/25
10A5	20/20

10A1: The class had the lowest number of students reading comics, the students claiming they did not have time. One of them thought comics were poor quality and did not improve his language skills.

10A2: The students who did not read comics responded that comics lacked sophistication.

10A3: Overall, the students considered reading comics as an entertainment.

10A5: The students were all enthusiastic about reading comics because they found them funny and entertaining.

Perhaps none of these findings are surprising. But Phase 1 of the enquiry was important in order to identify the students reading activities and, arguably, to provide evidence and insight to underpin the teacher researcher's own beliefs about her students and to provide the basis for Phase 2 activities.

PHASE 2:

ASSESSMENT:

Interviews with A2 Mathematics students

These students were presented with new material that, whilst it was similar to that existing in the curriculum, had not been read by them before. The students liked the new material because it was new, claiming that they found it challenging, especially their ability to interpret it unassisted by the teacher. But three members of the group were afraid that their marks would suffer expressing that if they were to be tested, they would prefer to use the old curriculum. Others, however, preferred to be tested using the new material because they "could answer for themselves" rather than memorize and reproduce what the teacher had told them. The students claimed that they were not afraid of learning new material but they did fear getting poor marks because of the problems that then arose. This suggests that the students fully recognized the constraints imposed by the testing regime in the school and the pressure they were under to gain high grades consistently.

An additional student from the A1 group was interviewed. He liked the new approach to assessment. He believed that he developed his own skills and answer for himself rather than in the way the teacher wanted him to think.

The Infomatics Group were not formally interviewed due to the constraints of time and the situation. However, the teacher was able to observe and noted the following: when they received the new material they appeared to be worried and perplexed but after an explanation offered by the teacher they were more composed. During the test they paid more attention than usual.

The Physics Group, who are perceived as able in the natural sciences but not interested in literature or the humanities, found the new material difficult and saw it as having a negative affect on their marks. Some of the students did not appear to take the test seriously whilst others were more focused.

TEACHING APPROACHES:

Three students were coded A, B, C.

- Student A: during the interview, A said that he liked exploring literature works himself and judged himself as being "rational". He believed that "deep emotions evoked from literature works belong to teachers, I'm not sure students feel the same." He paid attention to developing his learning skills. He responded that he liked the comparative method applied in the lesson, partly because he had the opportunity to work with new material.
- Student B: she claimed she liked imagining and associating pictures and emotions as well as living the lives of the characters in different works. "Sometimes when the teacher gave a good lecture, I was too deep in my imagination of the characters and I forgot what the teacher really said." She wanted to listen to interesting comments about literature from teachers. She found it difficult to express accurately some of her best ideas in words, consequently, she believed that the teacher did not really understand them. In her opinion, the comparative method could broaden

the meaning of the literature material but could not help her to explore the characters more deeply.

- Student C: C claimed that she preferred rational ideas and disliked rambling sentences. She liked to summarise the most important points of the literature lesson so that it was easier for her to remember them. She said that she liked the comparative method because it provided her with reasons to comment or analyse the material.

Three teachers were coded I, II, III.

- Teacher I stated that the application of comparative method was clear and suitable for the lesson. Comparison was not only applied as a teaching method but also as a literature skill to the students. The teacher had widened the meanings of the literature material. The shortcoming was that the teacher could have given the students the comparative material in advance so that they could have had a better preparation for the lesson.
- Teacher II believed that the comparative method was well applied so that it highlighted the creativeness of the author being studied. She believed that the shortcomings of the lesson were:
 - Some knowledge was not necessary for students of the literature standard curriculum.
 - The method is effective with high performance classes but would confuse students from the lower performance classes.
 - It is recommended for the teacher to use other methods in the lesson as well. The comparative method should only be applied for a few aspects of the literature curriculum.
- Teacher III claimed that the comparative method was suitable for improving students' creative ability and motivating them. It would be even more effective if it was applied in teaching student who were gifted in literature.

The shortcoming of this lesson was that the teacher should have let the students read the material in advance so that they would be more able to compare and contrast. Furthermore, comparative method is only one of the literature methods, or sometimes, just a technique to explore literary materials.

CONCLUSIONS

Overall it is difficult to provide a full assessment of the initiative at this stage. Nevertheless some tentative conclusions can be drawn. The students on the whole were positive because they appreciated the new pedagogic approach and they were interested in the new elements, both the materials and the approach to assessment. For them a major shortcoming was a lack of consistency between teaching and assessment. In addition the students are under considerable pressure to achieve high grades and as a consequence are reluctant to adopt new approaches. Teachers were only engaged in the final stages of Phase 2. Overall they too were positive but one was critical preferring the traditional approach. However the teachers were more critical of the comparative approach, not the actual teaching. All of them were agreed that the teacher should have spent more time preparing the students in advance.

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