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Educational Research and Reviews

Table of Contents: Volume 10 Number 19 10 October, 2015

ARTICLES

Research Articles

- A study on components of internal control - based administrative system in secondary schools** 2617
Paitoon Montri, Chaiyuth Sirisuthi and Preeda Lammana
- The extent to which teachers of Turkish as a foreign language accept themselves as competent** 2624
Filiz METE
- An examination of graduate theses related with guitar in terms of methodology and content: A case of Turkey** 2631
SadıkYöndem
- Factors affecting higher order thinking skills of students: A meta-analytic structural equation modeling study** 2639
Prayoonsri Budsankom, Tatsirin Sawangboon, Suntorapot Damrongpanit and Jariya Chuensirimongkol

Full Length Research Paper

A study on components of internal control - based administrative system in secondary schools

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The aim of this study was to study the components of the internal control-based administrative system in secondary schools, and make a Confirmatory Factor Analysis (CFA) to confirm the goodness of fit of empirical data and component model that resulted from the CFA. The study consisted of three steps: 1) studying of principles, ideas, and theories in related documents, 2) synthesizing and specifying them as components of the system, and 3) proposing these components to experts in the field for their confirmation on the appropriateness as components. Sample groups for the CFA comprised three groups with 300 samples i.e. 100 school directors, 100 school deputy directors, and 100 school teachers. A package program was applied to analyze collected data for mean, and standard deviation. Evaluation of the goodness of fit of the CFA Model was done by Chi-square, CFI, TLI, RMSEA and SRMR. Research results revealed that there were four components of the system i.e. Inputs, Process, Outputs, and Feedback. The Inputs comprised four components: 1) administrative resources, 2) learners, 3) administrative tasks in schools, and 4) policies, ideas, and directions on school administration. The Process comprised five components: 1) control environment including seven sub-components, 2) risk assessment including five sub-components, 3) control activities including seven sub-components, 4) information and communication including six sub-components, and 5) monitoring including three sub-components. The Outputs were considered from two results i.e. 1) school quality basing on the Thailand National Basic Education criterion, and 2) satisfaction of related people in the system. The Feedback data received was from school internal-control evaluation, and CFA results. It was found that the model had a good level of goodness of fit to empirical data when considering the goodness of fit index.

Key words: administrative system, internal control, secondary schools.

INTRODUCTION

Internal control is one of the equipment applied for administration and management. An idea of applying an internal control system in administration and management began after the events that occurred during business, and business organization failures in

1985 in the United States of America. Later on, in 1992, five associations on financial administration and professional institutes on audit jointly set up a working group to work for an appropriate internal control system suitable for modern circumstances and an improved

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financial report format to be more creditable. The stated working group was entitled the “Committee of Sponsoring Organization of Tread Way Commission” or “COSO”. After making a study and analysis, the Committee presented study results that revealed that an appropriate internal control process should consist of five components i.e. control environment, risk assessment, control activities, information and communication, and monitoring (Committee of Sponsoring Organization of the Treadway Commission, 1992). The presented study results were later, widely accepted and applied by leading business societies in various countries.

Thailand has rigorously accepted internal control to apply ever since 2001. The State Audit Commission issued a Regulation on Specification of Standard Internal Control B.E. 2544 which has been effective since the 27th October 2001. According to this regulation, a school is an auditee who needs to arrange an internal control system and report its results to the Commission at least once a year. In order to support the stated regulation, the Office of Basic Education Commission provided training courses for personnel of educational service area offices and educational institutes in Thailand to provide them with deeper knowledge on the internal control system and the reporting of its results so that they could be further developed, and performed in practice at their offices.

According to the regulation of the State Audit Commission, secondary schools are basic educational institutes taking a role as auditees. The school administrators are assigned to be responsible for academic, budget, personnel, and general administrations to achieve school objectives (Ministry of Education, 2003). With reference to a research report of Thammasart University Research and Consultancy Institute (2012), it was concluded that there are various problems and difficulties in basic education administration, for example, in an aspect of academic administration, schools have different variances of quality on educational curricula. For some schools which have resourceful teachers, school curricula can usually be developed collectively together as effective curricula. For schools which are not effectively able to develop their own curricula, they usually copy the curricula from other schools. In the aspect of budget administration, it is found that current budget allocation is not consistent with fact and is not obliging to classes arranged to serve various special projects. Budget for buildings and equipment restoration is late to be allocated. Budgets for public utility are not consistent with the fact. In the aspect of personnel administration, schools have problems with personnel capacity rate management, recruitment, appointment, transferring of unqualified school teachers to other schools, lack of professional personnel in the field of educational arrangement support for example education counselors, financial and procurement officers, lack of specific professional

officers, for example lawyers, nurses, etc. In the aspect of general administration, it is found that general basic performance, for example, student registration, specification of dates for the beginning of the term, and vacation, providing of special classes, mobilizing for educational resources, providing study trips for students, are all not consistent with each school’s context. Educational media and equipments are limited and out of date. All stated problems have affected national education quality. The results of many evaluations of Thai children and youths learning quality are lower than the standard (Office of the Education Council, 2012) are all important good reasons to confirm the prior statement. These are results of the weaknesses of school administration and improvement and development are urgently needed. Therefore, in order to enhance Thai education quality, school administrators need to have a more efficient control system to monitor work performance.

It is found that internal control process is an equipment usable for building up reasonable confidences i.e. work implementation will achieve the set objectives (State Audit Commission, 2008), being able to control or reduce risk to be at an acceptable level for the highest benefit to an organization in terms of being of worth devoted budget and resources, work will be performed transparently and inspectingly, preventions from risk, mistake and damage possibly occurred from work performance will be set (Niyamabha, 2007), opportunity for personnel in all levels to take part in the setting of a performance system and implementing it according to the set plan should be open in order to solve problems and develop efficient assigned tasks for the satisfaction of service receivers (Office of Director, Office of the Basic Education Commission, 2008). Nowadays, although an internal control system is applied in some schools, it still does not cover all aspects of schools’ tasks since the administration systems are driven by internal process that have not been developed specifically for educational institutions. The researcher, therefore, is interested in studying the components of an internal control-based administrative system in secondary schools. The components to be found from this study will be the direction for further development of internal control-based administrative systems in secondary schools.

Research questions

1. What are the components of an internal control-based administrative system in secondary schools?
2. What are the results of confirmatory factors analysis of process variables in an internal control-based administrative system in secondary schools?

Purposes of research

1. To study components of an internal control-based

administrative system in secondary schools,
2. To analyze confirmatory factors of process variables in an internal control-based administrative system in secondary schools

MATERIALS AND METHOD

Research procedure

The Study on Components of an Internal Control-Based Administrative System in Secondary Schools consisted of three steps as follows:

Step 1: Study of principles, ideas, and theories published in related documents and researches as follows:

Study information on system components formerly studied by both Thai and foreign academicians and published in documents, text books, and research works including ideas of Malithong (1997), Rodprasert (1998), Hirankitti (1999), Khammanee (2002), Bertalanffy (1968), Bittel (1978), Katz and Kahn (1978), Smith (1982), Schoderbek et al. (1990) and Lunenburg and Ornstein (2012).

The study result was concluded that the system consisted of four components: 1) inputs, process, 3) outputs, and 4) feedback.

Study of internal control process according to ideas of COBIT, SAC, COSO, SAS 55/78 (Colbert and Bowen, 1996), the Canadian CoCo's framework (Pfister, 2009), the Turnbull Guidance on Internal Control framework (Institute of Chartered Accountants in England & Wales, 1999), and the State Audit Commission Internal Control framework (State Audit Commission, 2008). The study results revealed that an internal control process consisted of five components: 1) control environment, 2) risk assessment, providing of control activities, 4) information and communication, and 5) monitoring.

Study of task frameworks of secondary school administration from the Handbook on Administration of Basic Education Institutions as Juristic Schools (Ministry of Education, 2003), Regulation on Criteria and Procedure of Educational Administration and Management Empowerment B.E. 2550 of Thailand Ministry of Education (2007), and study the Secondary School Performance Standard B.E. 2009 (Upper Secondary Education Bureau, 2009). The study result could be concluded that task framework of secondary school administration consisted of four aspects: 1) academic administration, 2) budget administration, 3) personnel administration, and 4) general administration.

Step 2: Synthesis of all study results from related documents and research works committed in Step 1 and specified components of an internal control-based administrative system in secondary schools.

Step 3: Proposing of components of internal control-based administrative system in secondary schools resulted from the synthesis in Step 2 to seven experts for their inspection and confirmation on appropriateness as system components. These field experts consisted of three experts in secondary school administration, two experts in internal audit and control, and one education advisor who is an expert in providing education advice, and one higher education lecturer teaching a course of internal control.

Confirmation factor analysis (CFA)

The CFA of system variables of internal control-based

administrative system in secondary schools was done to assure the goodness of fit between empirical data results from the study on components and the component model resulted from the synthesis. The procedure of CFA including:

Sample group

Sample group for CFA consisted of 300 samples from 100 secondary schools, three samples from each school consisting of a school director, a school deputy director taking responsibility in supervising school internal control affairs, and a school teacher in charge of school internal control tasks. Purposive Sampling was applied for selecting sample schools. The selected schools consisted of 50 schools located in Roi Et Province, 25 schools in Kalasin Province, and 25 schools in Yasothorn Province.

Instrument for data collection

Designed and developed by the researcher, a questionnaire for appropriateness of components of internal control-based administrative system in secondary schools was applied for data collection. It was of a 5 rating-scale questionnaire with .92 of reliability.

Data collection

A letter requesting the cooperation in providing research data issued by the Faculty of Education, Mahasarakham University and a questionnaire were sent to each school in the sample groups. The fulfilled questionnaires were returned to the researcher within 15 working days. For those which had not been returned on the stated date, the researcher made contact by phone calls. In some cases, the researcher went to the sample schools in person to get the completed questionnaires. Total completed questionnaires received were 300.

Data analysis

A package program was applied for Confirmatory Factor Analysis (CFA).

Statistics for data analysis

Mean and standard deviation were applied for data analysis. Discrimination of questionnaire was analyzed by t-test, and its reliability was analyzed by Alpha-Coefficient, according to Cronbach's alpha reliability procedure. Evaluation of goodness of fit of the CFA analysis model was done by Chi-square, CFI, TLI, RMSEA, and SRMR.

RESULTS

Results of the study on components of an internal control-based administrative system in secondary schools

Study results on components of the stated system from related documents and researches could be summarized as follows:

There are four system components including 1) inputs, 2)

System Environment

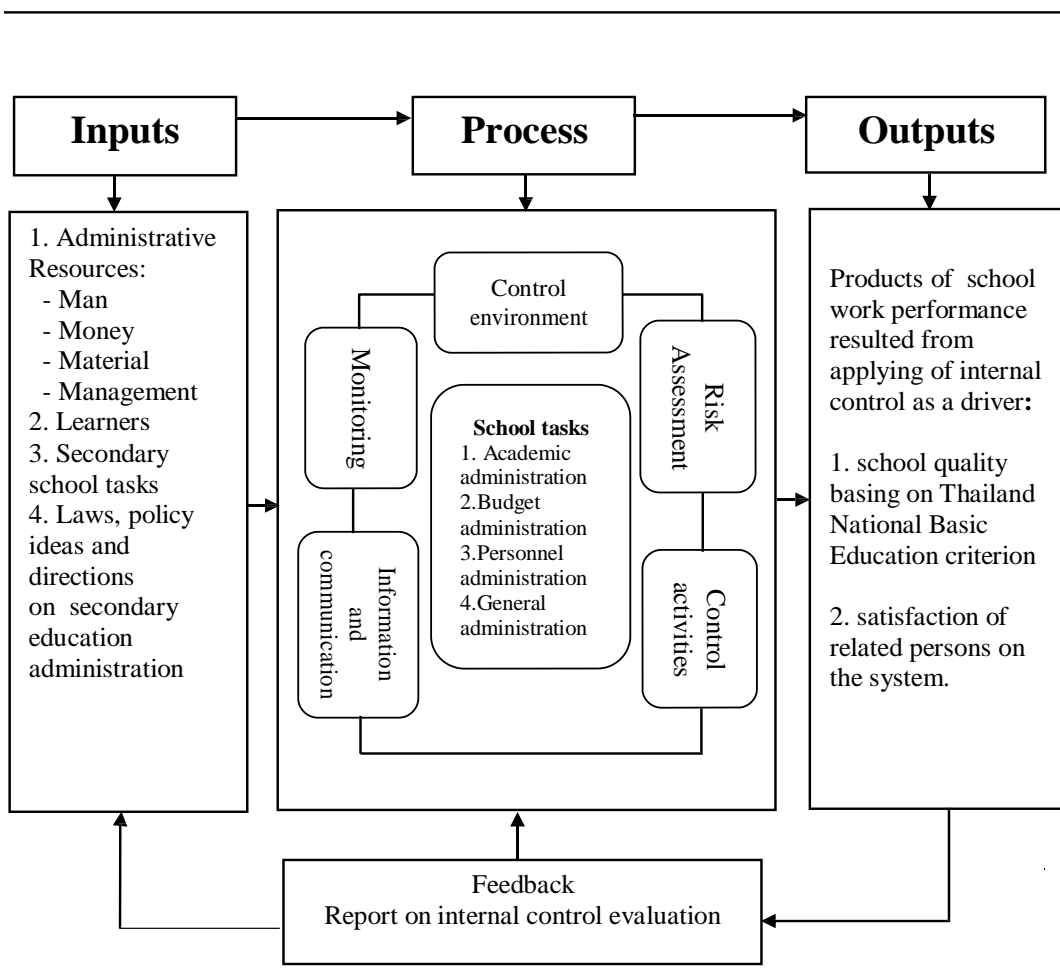


Figure 1. Components of internal control-based administrative system in secondary schools

process, 3) outputs, and 4) feedback. Internal process consisted of five components including 1) control environment, 2) risk assessment, 3) control activities, 4) information and communication, and 5) monitoring. Administrative tasks in secondary school consisted of four main tasks including 1) academic administration, 2) budget administration, 3) personnel administration, and 4) general administration. Based on synthesis results of ideas and theories learnt from related documents and researches in Step 1, components of an internal control-based administrative system in secondary schools could be defined as shown in Figure 1.

Results of Confirmatory Factor Analysis of components of an internal control-based administrative system in secondary school by field experts revealed the following components:

Inputs consisted of four components: administration

resources i.e. man, money, material, and management; learners; four school administrative tasks i.e. academic administrations, budget administrations, personnel administrations, and general administrations; laws, policies, ideas, and directions on school administration as mandated by higher affiliation

Process consisted of five main components and each consisted of sub-components as follows:

Control environment consisted of seven sub-components: philosophy and working forms of school administrative group, standard on honesty and ethics in school, standard on knowledge, skill and capability of school personnel, school-structure organization, empowerment and task assignment, policy and method on personnel administration, measures and mechanism for monitoring work performance.

Risk assessment consisted of five sub-components:

Table 1. Results of Confirmatory Factor Analysis (CFA) of internal control-based administrative system in secondary schools

Latent variable	Observable variable	Component weight	R ²	Component score coefficient
Administration process	Control environment	0.739**	0.546	0.454
	Risk assessment	0.752**	0.566	0.434
	Control activities	0.700**	0.491	0.509
	Information and communication	0.862**	0.743	0.257
	Monitoring	0.650**	<u>0.422</u>	<u>0.578</u>

Statistic values applied for testing of model's goodness of fit were Chi-square = 3.008, df = 4, Chi-square /df = 0.752, CFI = 1.000, TLI = 1.004, RMSEA = 0.000, SRMR = 0.010.

specification of school's objectives, specification of each work group's objectives, event identification, risk analysis, risk response.

Control activities consisted of seven sub-components: basic control activities, control activities for general administration, control activities for academic administration, control activities for budget administration, control activities for personnel administration, control activities for information administration, control activities for technology administration.

Information and communication consisted of six sub-components: information management, information evaluation, improvement of information, organizational communication, evaluation of organizational communication, improvement of organizational communication

Monitoring consisted of three sub-components: control-self assessment (CSA), assessment of internal control by outside assessors from time to time, improvement of internal control.

Outputs were products resulted from work performance with internal control process as a driver and by considering the following results: quality of secondary schools qualified basic educational standard, satisfaction of related persons with internal control-based administrative system in secondary school

Feedback was a report on internal control evaluation.

Results of Confirmatory Factor Analysis (CFA) are shown in Table 1. Table 1 indicated that there were five variables of components of the administration process were statistical significant at .01 level. They had component weight ranged from 0.650 to 0.862 and coefficient of prediction (R²) ranged from 0.422 to 0.743, and component score coefficient ranged from 0.257 to 0.578.

Results of CFA analysis of administration process model basing on internal control in secondary school revealed that the model conformed to empirical data at the good level, considering from the goodness of fit indices including Chi-square = 3.008, df = 4, Chi-square/df = 0.752, CFI = 1.000, TLI = 1.004, RMSEA =

0.000, SRMR = 0.010.

This indicated that in overall image, variables in the process model on an internal control-based administrative system in secondary schools were appropriate and data resulted from all variable measurement could be applied for analysis for further research study with SEM technique. Results of CFA could be transformed to a model as shown in Figure 2.

DISCUSSION AND SUGGESTIONS

According to the results of the Study on the Components of an Internal Control-Based Administrative System in Secondary Schools, there are some issues to be discussed as follows:

1. System components studied from related documents and research papers revealed that there were four main structures in the Internal Control-Based Administrative System in Secondary Schools i.e. inputs, process, outputs, and feedback. All of them were general basic structures of the system which were consistent with the ideas mentioned by Bertalanffy (1968), and by Bittel (1978) which also specified these four structures of the system. However, this idea differed from the ideas stated by Katz and Kahn (1987), Smith (1982), Schoderbek et al. (1990), and Lunenburg and Ornstein (2012) which specified the system environment as the fifth component of the system. However, as for the researcher, he analyzed the environment as something which was outside of the system. Although it might have influence on the system's working process, it was not a component in the system.

2. The results of Confirmatory Factors Analysis of the system made by field experts found that the "process" component of the Internal Control-Based Administrative System in Secondary Schools consisted of five components: 1) control environment consisting of seven sub-components, 2) risk assessment consisting of five sub-components, 3) control activities consisting of seven sub-components, 4) information and communication

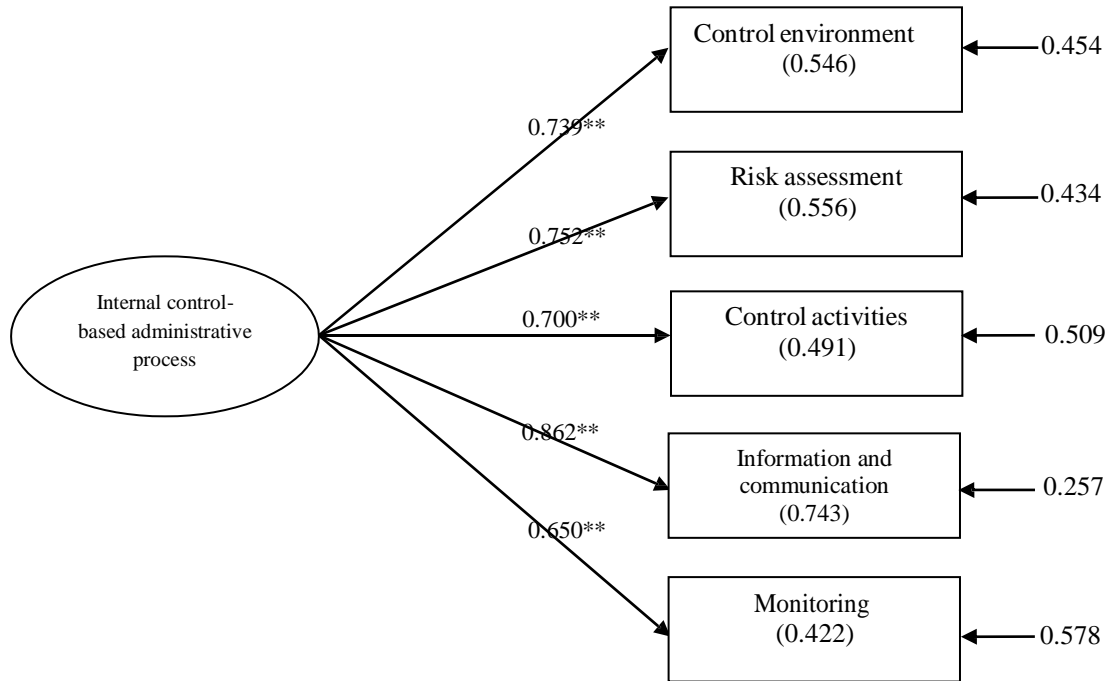


Figure 2. Model of Confirmatory Factor Analysis

consisting of six sub-components, and 5) monitoring consisting of three sub-components.

This was consistent with the ideas stated by COSO, SAS 55/78, the Turnbull Guidance on Internal Control framework, and the State Audit Commission Internal Control framework, which specified that there were five components in internal control system. However, it differed from ideas of COBIT, COCO, and idea of SAC specifying different components of internal control system. The possible reason was each model contained a different focus on each component, for example COBIT focused on information technology control, COCO in Canada gave precedence to financial reporting and management. Therefore, the model specially focused on human characteristics and feelings. While SAC gave precedence on internal audit so the set model had more focus on finding out the results that occurred than the setting of a controlling system. However, in general image, all models can be integrated as they contained similar goals that is to say, to control, prevent, decrease working weaknesses or risks, and solve organizations' problems.

3. The results of the Confirmatory Factor Analysis (CFA) revealed that the model was well consistent with empirical data when considering the Goodness of Fit Index: Chi-square = 3.008, $df = 4$, Chi-square/ $df = 0.752$, CFI = 1.000, TLI = 1.004, RMSEA = 0.000, SRMR = 0.010. It indicated that, in general image, variables in process model of Internal Control-Based Administrative System in Secondary Schools were appropriate. Data received

from every variable measurement were possible to be further applied in analysis for research study applying SEM technique. It indicated that the study process comprising of study on components from related documents, synthesizing them into components of Internal Control-Based Administrative System in Secondary Schools, and proposing the components to experts for confirmation, was systematically proceeded based on principles, and system theory. Therefore, when indices, which were observable variables, were proposed to related persons for their opinions and made a Confirmatory Factors Analysis, then consistent results were obtained. This, therefore, confirmed reliability of this research process that it was appropriate and consistent between theory and empirical data received from practical part.

Suggestions for further application of research results are:

1. Secondary school administrators and related people should study for deep understanding in components of Internal Control-Based Administrative System before application of the system elements for school planning and development, especially for the element on process having the internal control process as working driver. Deep understanding by school administrators and their ability in application of those components to their schools will enhance them to more success in school administration.
2. Each school has a different context from another. To

use these research results, a school administrator may need to adjust some sub-components or observed variables to be consistent with the school's context.

3. School administrators should deeply understand related theories, for example, system and system development, internal control, secondary school administration, etc.

Suggestions for further study,

1. Different components of sub-systems of the Internal Control-Based Administrative System in Secondary Schools, for example administrative systems on academic, budget, personnel, general administration, etc. should be further studied.

2. An Internal Control-Based Administrative System in Secondary Schools with the system components that resulted from this study should be developed for a new administrative system with an internal control as a working driver for success of school performance.

Conflict of Interests

The author has not declared any conflicts of interest.

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Full Length Research Paper

The extent to which teachers of Turkish as a foreign language accept themselves as competent

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The purpose of the present study is to determine the extent to which teachers teaching Turkish as a foreign language think that they are professionally competent. For this purpose, first the qualifications expected from these teachers were investigated and as a result of the literature review, these qualifications were grouped under three headings (knowledge, application, development). The statements put under these headings were turned into questionnaire items by the researcher after which the questionnaire was administered to the participants. The findings of the study show that high majority of the teachers think that they are highly competent. Moreover, it was found that the departments graduated from do not have significant impacts on their perception of self-efficacy. However, work leads to significant difference in the perception.

Key words: Language teaching, Turkish as a foreign language, teacher of Turkish as a foreign language.

INTRODUCTION

Language is a social phenomenon and reflects the ways of perceiving, thinking and living of a society. This is clearly seen in the saying of Atatürk "Turkish language is the heart, memory of the Turkish nation" (İnan, 1969: 352). Language is a vehicle to protect and transfer cultural links. Hence, teaching of a foreign language also includes the teaching of a new culture (Allwright and Bailey, 1991). Language teaching is somehow teaching of a culture. Culture is the living style of a society and language is the most powerful tool forming and transferring the culture by connecting individuals to each other through reflection of emotions and thoughts. Language brings the society into existence and transfers the existing culture. In this respect, teachers teaching Turkish as a foreign language open a window to Turkish

culture. Of course, the first thing to be seen by an individual looking through this window is the teacher. Therefore, a language teacher is like a mirror reflecting the culture of a society.

Determination of the qualifications to be possessed by the teacher is of great importance to reveal the current state and highlight the points to be developed. Specific subject area competencies of Turkish Language teachers, Turkish Language and Literature teachers and foreign language teachers were set up by the Ministry of National Education (MEB, 2008); yet, there is no institutional work conducted so far to determine the professional competencies of the teachers teaching Turkish as a foreign language. However, teaching of Turkish as a foreign language is a field requiring teaching

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qualifications different from those of Turkish Language teaching or any foreign language teaching.

Mother tongue teaching aims to impart skills rather than information (Kavcar, 2008:40). The main purpose of Turkish Language teaching is to enable students to acquire competencies in various skill areas. Each language represents a pattern of thinking, expressing and understanding with its own structural and semantic rules and functioning system (Yüce, 2005: 82). From the birth onwards, listening and speaking skills of people in their mother tongue start to develop. When they come to certain age, they start to get education to develop their reading and writing skills at school. In this respect, the aim of mother tongue education is to enable students already having mastered listening and speaking skills with the support of family and close environment to acquire reading and writing skills and to improve these four skills.

Foreign language can be described as another acquired language different from the mother tongue. Merger of syntax, content and use components of a language is realized through four basic language skills. Development of one skill affects the development of another skill. Foreign language acquisition requires teaching of four basic skills in a conscious and planned manner and mastering of knowledge, skills and perceptions related to the target language. Unlike mother tongue acquisition process, while learning the language of a foreign culture, it is usually unlikely to start learning with listening and speaking skills already mastered; hence, four skills should be taught and developed. The objectives of foreign language teaching can be understanding someone talking in the target language, speaking correctly and properly, reading and understanding a text written in the target language, writing intelligibly and having some information about the culture and traditions of the people using the target language as their mother tongue and understanding their living style (Türkkan, 1997:227). In this regard, the process of learning a foreign language is completely different from the process of learning the mother tongue.

Education is constantly changing and evolving dynamic structure. Teachers have the most important role in teaching-learning process. One of the main elements of the development of the evaluation model of the education system is important for the development of the teacher's performance (MEB, 2001:29). However, there is not even in existing higher education program about the field of teaching Turkish as a foreign language, yet.

Teachers teaching Turkish as a foreign language are graduates of departments such as Turkish language teaching, Turkish language and literature, English, German and French language teaching. The graduates of foreign language teaching departments get education to teach their respective foreign languages. The graduates of Turkish language teaching or Turkish language and literature departments get education to teach their mother tongue and improve their language skills. The teachers

teaching Turkish as a foreign language are provided with in-service training by the organizations and institutions after they start working in these organizations and institutions. However, as there is no cooperation and coordination among the institutions, there are some differences in this in-service training.

It is known that teaching of Turkish as a foreign language has been conducted inside Turkey and in many regions of the world by various organizations and institutions.

With the Fundamental Law of National Education put into force in 1973, teaching profession was defined as a profession responsible for conducting educational and related administrative duties (Articles 19, 20, 21). "In the Article 43 of the same law, it was stipulated that each teacher should have at least undergraduate education and for preparation to teaching profession, pre-service teachers should be equipped with general cultural knowledge, subject area knowledge, and pedagogic formation (Demirel, 1989:5). On the other hand, there is no program to give accredited special subject area education to the teachers teaching Turkish as a foreign language in higher education.

Today, the teachers teaching Turkish as a foreign language are the graduates of the departments of Turkish Language teaching, Turkish Language and Literature and foreign language teaching. Language and cultures are interrelated concepts. "Culture is connected to the ground and this ground is the character of the nation" (Atatürk, 1921:17). The teachers teaching Turkish as a foreign language should be trained in subject area specific programs so that they should be knowledgeable about Turkish history, culture, value system and mythology as well as Turkish language and they should have a comprehensive world view and general culture. However, the objectives of foreign language teaching programs do not comply with these expectations. In a similar manner, objectives of Turkish language teaching and Turkish Language and Literature programs are not suitable for the teaching of Turkish as a foreign language. Teaching of a language as a mother tongue is different from its teaching as a foreign language.

Teaching Turkish as a foreign language was initiated in a systematic way in the Republic era in the leadership of universities. Boğaziçi University and Ankara University took the lead in these attempts. These institutions have made great contributions to the research in the field.

The pioneering institution in this field is Turkish Language Teaching Center (TÖMER) established within the body of Ankara University in 1984. Particularly, in 1990s, Ankara University TÖMER made great contributions to the field by providing valuable resources for many master's theses.

In recent years, in line with globalization and changing policies, teaching Turkish as a foreign language has gained greater importance.

In the globalized world, because of its geopolitical location, Turkey and accordingly Turkish have gained

greater importance and as a result, the number of people wanting to learn Turkish as a foreign language has increased. According to the statements of the director of Turkish Linguistic Society, Prof. Dr. Şükrü Haluk Akalın (TDK, 2011), there are universities giving Turkish language education in nine countries. Depending on the density of Turkish population and wish to learn Turkish, there are 87 countries offering Turkish language courses in secondary education. In addition to this, there are 46 countries offering private Turkish language courses. The number of countries where there are Turcology departments in which Turkish language is taught and Turkish language and literature research is conducted is 28.

As a result of his studies in 2005, Dolunay reported that there are 223 language teaching centers teaching Turkish for academic and educational as well as commercial and tourism purposes in 57 countries.

As a conclusion, Turkish language taking the fifth place among the most widely spoken languages of the World is taught to the foreigners both in Turkey and abroad in language schools of universities, Turcology centers, private and state language courses and foundations and associations. Educators who will teach Turkish as a foreign language should have adequate information about Turkish history, culture, value system and mythology as well as about Turkish language itself.

In today's world, there is a rapid change in every field of life. In business life undergoing continuous change, it is very costly and difficult to evaluate workers and monitor their development. At that point, performance evaluation comes to the fore to achieve organizational objectives and to determine the personal contributions of the workers to the fulfillment of these objectives (Helvacı, 2002:5). In this regard, performance evaluation is a process used to assess workers' personal achievements and behaviors for a certain period of time. In performance evaluation, there is no failure. The main purpose is to develop the existing one.

Performance can be classified as individual and organizational performance. Individual performance can be defined as working performance of a worker manifested in a certain period of time (Pakdil, 2001:10). In the simplest terms, performance can be defined as the measurement of efficiency (Filiz, 2004:9). A good evaluation means deeply focusing on the goals of education rather than being engrossed in short-term goals (Boud, 1998:2). Effective evaluation means thinking clearly and revising and this does not take as much time as frequently recurring activities.

There are many methods developed to evaluate individuals' performance levels. Performance evaluation methods are divided into two in literature as classic and modern performance evaluation methods. According to a study (Adanalı, 2008), when compared to traditional methods, alternative assessment and evaluation methods lead to more positive outcomes. Self-evaluation is one of the alternative evaluation methods including meta-

cognitive knowledge for development in active learning environments.

What a teacher should know and does not know should be elicited for the teacher to execute his/her duties effectively. This may also help the teacher to raise his/her awareness of the present state and to determine the needs of education. Determination of the present state can be performed sometimes through director and expert evaluation and sometimes through teacher evaluation. According to Kubat (2012:56), a person's evaluation of his/her performance and himself/herself by considering all his/her main duties, functions and responsibilities is self-evaluation. In this way, workers can see what criteria are used in their performance evaluation. Therefore, self-evaluation is of great importance to make contribution to securing of justice (Birben, 2000:33). Moreover, self-evaluation of teachers is important to determine the educational needs and arrange the education accordingly.

In the present study, based on what types of differences among the teachers teaching Turkish as a foreign language lead to different outcomes in relation to their duties, it is investigated on which subjects the teachers find themselves competent and the extent to which they think they are competent.

METHOD

The purpose of the present study is to reveal the extent to which the teachers teaching Turkish as a foreign language find themselves competent in their profession based on their own evaluations.

For this purpose, answer to the research question "what is the extent to which the teachers teaching Turkish as a foreign language see themselves competent?" was sought.

In this regard, two sub-questions were generated in the present study.

1. Is there a significant difference in the extent to which the teachers find themselves competent based on the undergraduate program they graduated from?
2. Is there a significant difference in the extent to which the teachers find themselves competent based on whether they work in Turkey or abroad?

Research model

Within the study, national and international works related to the subject of the present study were examined through document analysis method. From the data collected in this way, qualifications expected from a teacher teaching Turkish as a foreign language were elicited and worded as questionnaire items. The items were subsumed under three themes: A. Knowledge, B. Application, C. Development. There are three sections in A. Knowledge theme, five sections in B. Application theme, and four sections in C. Development theme. In this way, 3 themes and 12 sections were formed. So a questionnaire was created by 44 items belonging to these 12 sections. Then they were presented to the scrutiny of 9 field experts and in light of their feedback, the total number of the items was reduced to 44.

These items were then transformed into 5-point Likert format (1. I have low level of competency, 2. My competency needs to be

Table 1. Personal information

	Frequency	Percentage
Undergraduate program		
Turkish Language Teaching	13	24,0
Turkish Language and Literature	19	35,1
German Language Teaching	7	12,9
French Language Teaching	7	12,9
English Language Teaching	4	7,4
Hungarian Language Teaching	2	3,7
Latin language	1	1,8
Arabic	1	1,8
Total	54	100
Place of Duty		
Abroad	36	66,6
In Turkey	18	33,3
Total	54	100
Length of service		
0-5 years	23	42,5
6-10	13	24,0
11-15	5	9,2
16 or more	13	24,0
Total	54	100

developed, 3. I have moderate competency, 4. I am competent, 5. I am highly competent).

In the questionnaire administered on voluntary basis, the participants were asked to evaluate themselves according to this 5-point Likert scale.

Study group

The present study is limited to the teachers teaching Turkish as a foreign language in Turkey and abroad. The number of teachers participating in the study is 54 (Table 1).

Out of 54 participants of the study, 32 (59.2%) are graduates of Turkish Language Teaching and Turkish Language and Literature programs of universities, 22 (40.8%) are graduates of foreign language teaching departments such as English, German and French. Thirty six of the participants (66.6%) work abroad and 18 (33.3%) work in Turkey. Out of totally 54 participants, 23 have a length of service of 0-5 years, 13 (24.0%) have a length of service of 6-10 years, 5 (9.2%) have a length of service of 11-15 years and 13 (24.0%) have a length of service of 16 years or more.

Data collection instruments

In the first section of the questionnaire, explanations are made and personal information is collected. In the second section of the questionnaire, expectations from the teachers teaching Turkish as a foreign language are grouped under the themes of Knowledge, Application and Development and under the theme of Knowledge, there are three sub-headings (language and linguistics, methods and techniques, properties and rules of Turkish language), under

the theme of Application, there are five sub-headings (planning, setting arrangement, material use, development of four skills, assessment and evaluation) and under the theme of development, there are four sub-headings (language use, language and culture interaction, communication and cooperation) and under all these sub-headings, there are totally 44 items.

The data obtained from the questionnaire used in the present study conducted to determine the extent to which the teachers teaching Turkish as a foreign language think that they are competent in teaching the language was analyzed as follows: 1. I have low level of competency, 2. My competency needs to be developed, 3. I have moderate competency, 4. I am competent, 5. I am highly competent.

Data analysis

The questionnaire was administered on voluntary basis and totally 60 questionnaires were returned; but 6 of them were found to be invalid and accordingly 54 questionnaires were considered for analysis.

In order to establish reliability, Cronbach Alfa reliability coefficient was calculated and it was found to be reliable (Cronbach Alfa Coefficient=0.975). Moreover, the mean of the scores taken from the related parts was found to be 4.61 and their standard deviation was found to be 0.38; accordingly, it was concluded that they displayed attitude over the average.

The data collected in the study were transferred into SPSS (Statistic Package for Social Science) package program for statistical analysis. In the analysis of the data, Cronbach alpha, frequencies, percentages, arithmetic mean and Mann-Whitney U test were employed.

Table 2. Results as a whole.

	Frequencies	Percentage
Highly competent	34	62,8
Competent	18	33,5
Moderately competent	2	3,7
Total	54	100

Table 3. Knowledge section.

Competencies	Frequencies	Percentage
Properties and rules of Turkish language	34	63,5
Language teaching, approaches, methods and techniques	11	20,3
Components of the Language and linguistics knowledge	9	16,6
Total	54	100

Table 4. Application section.

Competencies	Frequency	Percentage
Planning of the teaching process in line with the purpose	5	9,2
Arrangement of learning setting	7	12,9
Use of appropriate materials and resources	8	14,8
Developing students' listening, reading, speaking and writing skills	32	59,2
Monitoring and evaluating the process	2	3,7
Total	54	100

Table 5. Development section.

Competencies	Frequency	Percentage
Paying attention to proper and effective use of Turkish	35	65,3
Being sensitive to language and culture interaction	5	9,2
Being willing to communicate	9	16,6
Being eager to develop professionally	5	9,2
Total	54	100

FINDINGS AND DISCUSSION

In this section, the data collected in the study and the participants' personal information such as undergraduate program graduated, place of working and length of service are presented (Table 2).

Out of the participants, 62.8% think that they are highly competent, 33.5% think that they are competent and 3.7% think that they are moderately competent. This indicates that in general participants think that they are competent in teaching Turkish as a foreign language.

From Table 3, it is seen that the participants think that they have the highest level of competency in the properties and rules of Turkish language.

In the application section, it is seen that the participants think that they have the highest level of competency in developing students' listening, reading, speaking and writing skills (Table 4).

From Table 5, it is seen that the participants think that they have the highest level of competency in paying attention to proper and effective use of the language.

The results of Mann-Whitney U test run with the total score means show that the program graduated does not lead to significant change in competency levels of the participants ($P > 0.05$). However, the results of the same test indicate that the competency levels of the participants vary significantly based on where they work. There is a significant difference between the competency levels of

the teachers working in Turkey and those of the teachers working abroad ($P < 0.05$). The mean score of those working in Turkey is $\bar{x} = 4.75$ and that of those working abroad is $\bar{x} = 4.50$. This means that those working in Turkey see themselves more competent than those working abroad.

It is widely agreed that setting is of great importance in teaching of a foreign language. What is the most important thing in this regard is whether the setting of teaching is the place where the target language is used as a mother tongue. As teaching target language in an environment where it is used as a mother tongue is a facilitating factor, those learning Turkish in Turkey are naturally more successful and hence, teachers working in Turkey may feel more competent. On the other hand, for teachers working abroad, teaching Turkish can require more effort. In this respect, more qualifications are expected to be possessed by teachers working abroad. While there are many components supporting teaching in Turkey, the teacher is the most important element abroad.

The data collected indicate that the teachers of Turkish as a foreign language are the graduates of different programs such as Turkish language teaching, Turkish language and literature, English, German and French teaching. For teachers to meet the requirements of their profession, not only the quality of the education they get but also their beliefs in their competency are of great importance (Yılmaz et al., 2004). The results of the analyses revealed that the program graduated does not lead to significant differences in competency levels of the teachers. Therefore, it can be argued that the program graduated does not affect the teachers' opinions about teaching Turkish as a foreign language. The competency level of the teachers working in Turkey is greater than that of the teachers working abroad. The basis of language teaching is the development of four language skills. Development of language skills is directly related to their frequency of use. Being a living entity, the language can be improved as long as it is used (Çelebi, 2006:287). The frequency of using Turkish abroad is lower than that of using it in Turkey. It's known that in foreign language teaching the place, where the target language is spoken as a native language, has supportive and facilitative effects (Mete, 2003:19). Hence, teachers teaching Turkish abroad need more support than teachers teaching it in Turkey.

The results of the study show that in general 34 (62.8%) of the participants think that they are highly competent, 18 (33.5%) of them think that they are competent and 2 (3.7%) of them think that they are moderately competent. This indicates that in general, the participants find themselves competent enough. Morrissey (1981), indicates that the candidates of teachers can develop self-efficacy beliefs and attitudes only in education faculties. However, there is not a higher education program about teaching Turkish as a foreign

language yet.

When the findings of the questionnaire were evaluated according to the sections, following results were obtained. Among the components making up the Knowledge section, the participants think that they have the highest competency in properties and rules of Turkish (63.5%).

The teachers are the graduates of different departments of universities and the properties and rules of Turkish make up the subject area knowledge; hence, the teachers to be educated to teach Turkish as a foreign language should be provided with training about these properties and rules. In the present study, it was found that the teachers think that they are the least competent in language teaching approaches, methods and techniques; hence, it can be argued that they did not have enough training on these issues and they need more training on how to conduct language teaching.

Among the components making up the Application section, the participants think that they have the highest level of competency in developing their students' listening, reading, writing and speaking skills (59.2%).

Language teaching involves improving four language skills. In this regard, the teachers' finding themselves competent in improving their students' language skills is understandable. It is also comprehensible that those teachers have difficulties to plan instructional activities due to having diverse educational backgrounds that are not compatible to what they teach.

Among the components making up the Development section, the participants think that they have the highest level of competency in paying attention to the proper and effective use of English (65.3%). The teachers' thinking that they have a high level of competency in proper and effective use of the language is reasonable as they teach this language. However, they think that they have low level of competency in professional development and cooperation and this may indicate that they are aware of their shortcomings in these areas.

The participants think that they have the lowest level of competency in components of language and linguistics knowledge under the section of Knowledge, monitoring and evaluating teaching process under the section of Application and in willingness for cooperation to improve professionally and being sensitive to development under the Development section.

There is no participant marking "I have low level of competency" or "My competency needs to be developed" options in the questionnaire. Depending on these findings, it can be postulated that the participants perceive themselves as adequate in terms of teaching Turkish as a foreign language.

If all the teachers teaching Turkish as a foreign language were involved in the study, it would be more informative and useful. Moreover, getting students' opinions about the process can be very useful to support this study conducted based on teachers' opinions. In light

of the findings of the present study, following suggestions can be made: a coordination center should be established to ensure coordination in terms of applications and materials, more support should be provided for teachers working abroad, continuous information exchange should be conducted and in-service trainings should be updated.

Conflict of Interests

The author has not declared any conflicts of interest.

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Full Length Research Paper

An examination of graduate theses related with guitar in terms of methodology and content: A case of Turkey

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The aim of this study is to examine post-graduate thesis completed on guitar in Turkey. For this purpose, a total of 89 theses were investigated in terms of selected research topics, study participants, and methods for analysis. For the selection of the thesis included in this study three criteria were used; first, theses from 1990 (beginning time for first completed theses on guitar topic) to 2013 period, second, reaching the full text of theses, and third permission of author. The number of thesis investigated in this study represents about 93% (105 at total) of whole completed theses from different institutions in Turkey. Descriptive survey and content analysis method were used for examination of theses. The results of study showed that while selected theses topics reflect more diversity and school related issues at Faculty of Educations (using guitar at school music, teaching methods, etc.), the piece analysis from different composers was mostly selected study topic at Conservatories and the Fine Art Faculties which parallel to institutions mission. As a conclusion, there are some summarized results and recommendations for upcoming researches on this guitar or guitar education in the light of completed theses and related research literature.

Key words: Graduate theses, guitar, music, guitar education, descriptive content analysis.

INTRODUCTION

Graduate education is an important stage of education that enables profundity in science. At this stage, graduate students can learn the scientific language, make independent research and specialize at some topics in order to meet the demand of related institutions. In this context, graduate education is among the most important mission of universities especially in terms of generating scientific knowledge as Demirel (2007) stated. The important functions of universities such as doing research and producing new technologies are mostly accomplished during the graduate studies. According to Tebis and Okay (2013), graduate education helps

researchers to accurately identify what they want to study, select the most appropriate method, and report their study findings.

Historically, after the foundation of Turkish Republic in 1923, universities and graduate programs were restructured and major scientific advances have been reported in the social and physical science areas in Turkey. However, graduate programs and scientific research culture began much later in the areas of music and art. In 1982, all higher education institutions of Turkey including conservatories, fine arts and related departments were gathered under a single roof with the

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Table 1. The distribution of guitar theses scanned in the thesis data center between the years of 1990-2013 according to universities.

Universities	N	%
Gazi	18	17.1
Mimar Sinan	18	17.1
Marmara	14	13.3
İstanbul	11	10.5
A.İ.B.Ü.	7	6.7
Selçuk	4	3.8
Haliç	3	2.9
İnönü	3	2.9
Kocaeli	3	2.9
Atatürk	2	1.9
Dokuz Eylül	2	1.9
Hacettepe	2	1.9
İTÜ	2	1.9
Kafkas	2	1.9
Mersin	2	1.9
Niğde	2	1.9
Uludağ	2	1.9
Other universities	5	5.2
Total	105	100

Table 2. The distribution of theses scanned in the thesis data center between the years 1990-2013 according to their levels.

Theses	N	%
Master	81	77.14
Doctorate	17	16.19
Proficiency in arts	7	6.66
Total	105	100

establishment of Council of Higher Education. This process began working and graduate theses and dissertations were produced in the fields of music and fine arts. Namely, lots of studies were carried out regarding music, music education and musical instruments.

Scientific researches seem to be rapidly increasing day by day in the field of music despite the field-related difficulties and long term research process (Schmidt and Zdzinski, 1993) The analysis of scientific thesis on a certain field may give information about the profundity and extensity of that subject and reveal the general appearance of the investigated field (Karadağ, 2009). The field of music education like other educational fields needs to constantly renew itself through peer review and assessment processes. Therefore, the studies conducted in the field of music education should be examined and reviewed at regular intervals to determine the research

tendencies in this field. The results may be directive to many scientists who conduct or want to conduct studies in this field (Cohen et al., 2007). Criticizing the quality of the graduate research also helps to improve the quality of papers which will be published.

Many review studies were performed in the fields of fine arts, music and music education in Turkey. For example, Altinkurt (2007) focused on the examination of theses written about art education. Sağır and Ayhan (2005), and Karkın (2011) summarized the theses written about music. Similarly, Ece (2007) tried to make a bibliography of papers about music published in scientific journals. Some researchers focused on the examination of theses on string instruments (Tebiş and Okay, 2013; Orhan, 2012; Varış, 2012; Demirbatır, 2008) in terms of different variables such as institutions, subjects and method of analysis used in those studies. Ataman (2009), reviewed the theses written about flute and flute education in Turkey. On the other hand, there is only one limited study about the analysis of guitar theses (Yalçın, 2010) which focused on mostly cited journals, books and different theses used in the reference parts of those theses. There is still a need for a comprehensive review of guitar theses produced in Turkey.

The aim of this study is to examine post-graduate thesis on guitar in Turkey according to subject and methodology to determine general trends in this research area. In this context, sub questions are following. In this context, the sub questions are; 1) Which topics are frequently studied? 2) Which types of research are used? 3) What kinds of research designs are selected? 4) What kind of sampling methods is used? 5) What kind of research participants is selected? 6) Which tools were used for data collection? 7) What kind of analysis methods was used frequently in these graduate theses?

METHOD

The present study is a descriptive survey, content analysis method and descriptive statistics used for examination of related theses (Göktaş et al. 2012). Descriptive survey model determines the relationships between observations, recording, events in the science and makes generalization through controlled, unchangeable principles (Yıldırım and Şimşek, 2006). This survey study aims to examine graduate theses on guitar in Turkey. The dissertations included in this study were downloaded from the database of Council of Higher Education (CHE) which is the mostly used database by review studies (Kurtoğlu and Seferoğlu, 2012; Şimşek et al. 2009; Bertan et al. 2009) by searching the keywords "guitar" and "guitar education". 107 theses indexed in this field. Table 1 presents the distribution of number of completed theses according to universities (with the range of 1 minimum to 18 maximum), two of them were excluded from the study as they were not related to the guitar (one of them was about novel analysis and the other one was about tuner). Out of 105 theses, master theses are leading with a number of 81 (%77), and followed by doctorate theses with a number of 17 (%16), and 7 (7%) proficiency in art theses (Table 2). Finally, a total of 89 theses were investigated in terms of selected

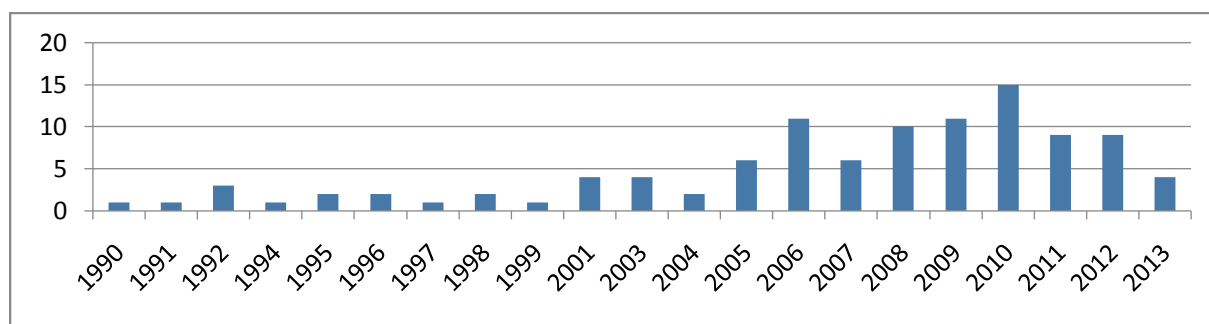


Figure 1. The distribution of thesis according to year.

Table 3. The distribution of the theses according to the types of schools and institutions

Schools	Education Faculties Ff	Conservatoires	Fine Arts Faculties	Total	
n	54	26	9	89	
%	60.7	29.2	10.1	100	
Institutions	Social Sciences	Physical Sciences	Educational Sciences	Fine Arts	Total
n	55	12	20	2	89
%	61.8	13.5	22.5	2.2	100

research topics, study participants, research design, sampling methods, methods for analysis and responsible institutions. The theses included in this study are selected based on the following three criteria; dissertations from the time 1990 (beginning time for first completed of dissertation on guitar topic) to 2013 period, reaching the full text of dissertation, and permission of authors. The number of dissertations were investigated in this study represents about % 93 (105 at total) of whole completed dissertations from different institutions in Turkey.

The distribution of the 89 investigated theses in this study according to years is seen in Figure 1. It is seen that the number of theses were increased moderately after the year 2005 while before this time only one thesis was prepared per year.

As seen in Table 3, 60.67% of theses were prepared in Music Education Programs which included in Faculty of Education, 29.21% of them in Conservatoires and 10.12% of them in Music Schools of the Faculty of Fine Arts. The numbers of theses in Table 3 show that more than half of the theses prepared in Education Faculties. One of the reasons of this high number of theses in Education Faculties may be the earlier incorporation of music education programs in academic settings. The other reason may be explained by interactions with other fields of academicians may increase motivations of music education program researchers. The distribution of theses according to the institutions in which they were done is seen in Table 3. It is seen that a majority of the theses were done in "social sciences institutions" (61.79%). This is followed by the "educational sciences institutions" (20.48%). "Social sciences institutions" and "physical sciences institutions" had undertaken the conducting of master studies of universities in the years when thesis writing first began. The need to categorize art fields more in social sciences field caused more theses to be done in "social sciences institutions". The theses of the last couple of years have been conducted by this institution as the master studies of the departments cultivating teachers began to be conducted by

the "educational sciences institutions" following years. In this regard, the theses written by the "educational sciences institution" have increased gradually in recent years.

Data collection tools and data collection

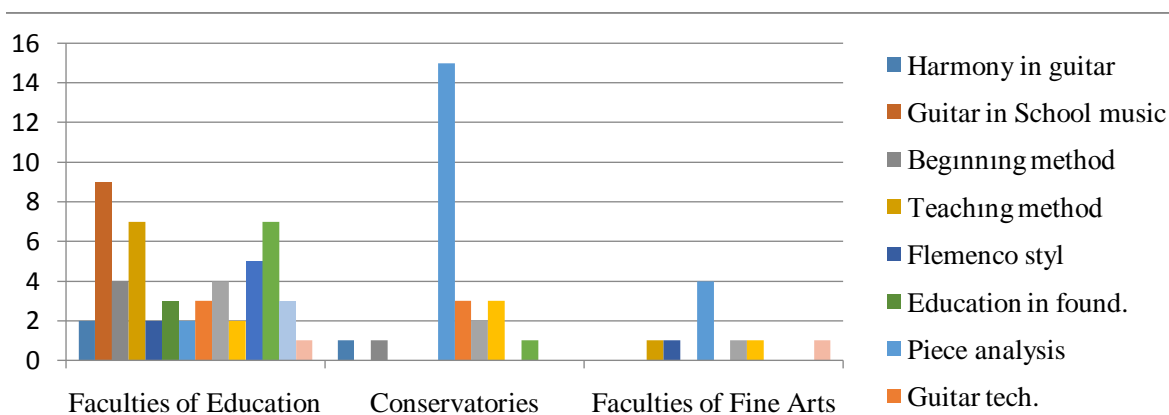
A "Theses Evaluation Form" with similar forms used by previous studies (Kurtoğlu and Seferoğlu, 2012) is prepared by the researcher. The form was also reviewed by two different experts for content validity with doctorate degree in assessment and evaluation field. The prepared form consists of eight sections; 1) the identity of the theses (topic of theses, author, publication year, responsible university and institute), 2) main subject, 3) type of research method (quantitative, qualitative, mixed), 4) research design (descriptive, experimental, case study, action research, survey, other), 5) data collection tools, 6) study participants-sample, 7) methods for sample selection, 8) data analysis methods. For the classification and evaluation of theses according to Theses Evaluation Form, due to the high numbers, only 5 of all included theses which selected randomly assessed by researcher and two experts with doctorate degree in assessment and evaluation field. In the assessment of 5 sample theses, it was seen that there is a significant assessment conformity (about 85%) between three different experts. And also conflicts between experts opinion were discussed until reaching a more conformity.

Data analysis

The collected data from theses which were examined via content analysis, were analyzed by using descriptive statistics (frequency and percentages). Content analysis is a coding system of written, told, or visual materials as meaningful codes and provides to

Table 4. The distribution of the topics studied in the theses examined.

Topics	N	%
1-Harmony Implementations in Guitar	3	3.37
2-Use of Guitar in School Music	9	10.11
3-Examination of Guitar Beginning Methods	5	5.61
4-Teaching methods (Examination and new methods, using technology)	8	8.99
5-Guitar in Flamenco Style	3	3.37
6-Guitar education in different institutions	3	3.37
7-Piece Analysis	21	23.60
8-Guitar technique, studying methods, concert program	6	6.75
9-Turkish Music adaptations to guitar	7	7.87
10-Guitar History, life of the composer	6	6.75
11-Guitar Performance, Interpretivism, Evaluation of student success	5	5.61
12-Other (Comparing with other instruments, Developing Scales, Professional Competency perception, Musician sicknesses, Guitar in hearing education, Holding)	8	8.99
13-Teaching schedule (development, preparation, implementation, evaluation)	3	3.37
14-Early age guitar education	2	2.25
Total	89	100

**Figure 2.** The distribution of the topics according to the theses done in institutions.

determine, summarize and specify fundamental content of observations. It can also be expressed as to reach concepts and relationships which will explain the obtained data (Çalık et al., 2014; Krippendorff, 1984). In this study, content analysis was used to classify the theses in terms of main subjects, type of research method, research design, data collection tools, study participants, methods for sample selection, data analysis methods.

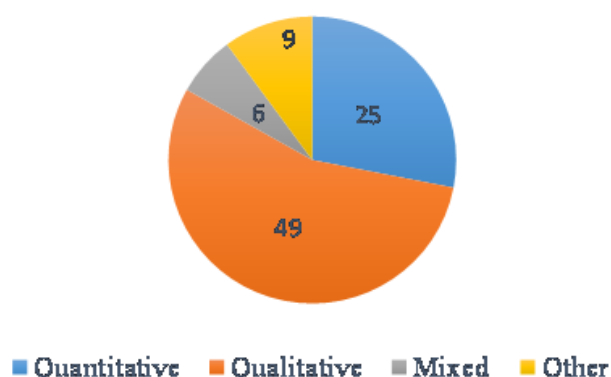
FINDINGS

A total of 89 theses for all of which permissions were obtained from the authors and whose full texts were accessed were included in the framework of the research. These theses were studied in line with the determined research problems. The data in the theses were drawn

into the Theses Examination Form and categorized. The following sub-problem questions were tried to be answered for solving the determined problem situation.

Frequency of studied research topics

As seen in Table 4 and Figure 2, the most used topic is seen to be "piece analysis" (23.60%) followed by "using guitar in school music" (10.11%), "teaching methods" (8.99%) and "others" (8.99%). The topics "guitar technique", "guitar history", "guitar performance" and "beginning methods in guitar" took place by a fewer percentage. It is observed that the topic "piece analysis" which is the topic with highest percentage was selected

The distribution of the research methods**Figure 3.** The research methods used in theses.

more in departments based on performance such as conservatories. It can be said that the reasons why researchers chose these topics more often are that these institutions have programs based on performance and based on this, their curiosity to acquire more information about the pieces they play and the habit brought by the fact that previously written theses are in this way. Topics related to schools and teaching such as "guitar in school music", "teaching methods", "guitar history" and "guitar technique" were more preferred in institutions such as faculties of education. The fact that the topic of piece analysis was most preferred in conservatories as the thesis topic although most of the guitar theses were done in faculties of education shows that the faculties of education are richer in terms of topic diversity. It is seen that the focus is on piece analysis in "Conservatories" and "Faculties of Fine Arts".

Types of research method

When Figure 3 is examined, it is observed that qualitative research method is mostly preferred in theses. The percentage of using qualitative research methods is 55.05%; quantitative techniques, 28.08%; others, 10.12% and mixed, 6.75%. The fact that the topic "piece analysis" which requires document review was mostly chosen as it is seen in the previous table can be seen as the reason for the excessive using of qualitative analysis technique.

Kind of research designs

As seen in Table 5, descriptive design (41.57%), survey design (28.08%), experimental design (14.60%) were used in theses as the research design. These were followed by case study, action research and combined

Table 5. The distribution of the research designs used in theses.

Research design	N	%
Descriptive	37	41.57
Experimental Design	13	14.60
Case Study	7	7.88
Survey	25	28.08
Action Research	4	4.50
Combined (Descriptive, Survey)	2	2.25
Other (Dialoguing Literature)	1	1.12
Total	89	100

Table 6. Methods to determine sampling

Type of sampling methods	N	%
Purposeful Sampling	27	30.35
Convenience Sampling	3	3.37
Random Sampling	5	5.61
Cluster Sampling	3	3.37
Whole Nature of the Research	10	11.24
Not Specified	41	46.06
Total	89	100

design respectively. The facts that the topics are usually chosen as appropriate for description and that preferring the studies which do not necessitate advanced statistics can be seen as the main reasons why descriptive design is more used.

Types of sampling method

According to Table 6, when we examine the methods of determining working groups we see that this topic is 46.06% not specified in the theses. Purposeful sampling at a rate of 30.35%, random sampling at a rate of 5.61% and whole nature of the research at a rate of 11.24% was taken. Convenience sampling and cluster sampling have fewer rates. The fact that the methods of choosing working groups are mostly not specified shows that working groups are not included in theses. This stems from the selection of the topics and the techniques to determine a working group to be used.

Selected research participants

When Table 7 is examined, it stands out that the document at a rate of 52.81%, university students at a rate of 17.97% and instructors at a rate of 16.85% as the

Table 7. The distribution of research participants

Type of research participants	N	%
Instructor	15	16.85
Teacher	2	2.25
Primary School Students	6	6.75
Secondary School and High School Students	3	3.37
University Students	16	17.97
Document-transcript	47	52.81
Total	89	100

Table 8. The distribution of data collection tools.

Data collection tool	N	%
Questionnaire	16	17.98
Scale	2	2.25
Test	9	10.11
Document (Notes, Website, Encyclopedia)	41	46.06
Interview	7	7.88
Observation	4	4.50
Multiple (Interview-document-questionnaire)	5	5.61
Other (Personal Information Form, Websites)	5	5.61
Total	89	100

most studied groups as working groups. It is seen that working groups were selected from sources close to the working environment and that the researchers preferred document scan more.

Data collection tools

As it is illustrated in Table 8, document reviewing is the most used tool at a rate of 46.06% as a data collection tool. Questionnaire at a rate of 17.48%, test at a rate of 10.11% and interview technique at a rate of 7.88% were used. While the multiple techniques in which many techniques are used together were used at a rate of 5.61%, the observation technique was used the least at a rate of 4.50%. The fact that document reviewing technique is the most used technique in collecting data for theses on guitars show that it stems from the fact that theses on guitars focus on piece analysis.

Frequency of data analysis methods

According to Table 9, it is seen that descriptive statistics were used mostly as data analysis method at a rate of 79.78%. This is followed by Anova, t-test, nonparametric and other methods respectively. It can be said that

comparative topics, experimental topics and techniques with multiple variables were not used in thesis on guitars, thus beginner level techniques were used to make analyses.

DISCUSSION and SUGGESTION

This study, which analyzes 89 postgraduate theses studies made in the field of guitar between 1990-2013 years in Turkey, includes important descriptive findings about theses subject orientations, methods, and research techniques.

In the practiced analysis, it is found out that with regard to subject orientation, most studied subject is "composition analysis" and it is respectively followed by "use of guitar in school music", "teaching methods", and "other" subjects (comparison of guitar with other instruments, scale development). In lower rates, there are "guitar techniques", "guitar history", "guitar performance", and "beginning methods of guitar". It is observed that "composition analysis" is chosen as research subject mostly in performance-based departments such as conservatory. In also Tebiş and Okay (2013)'s recent study, composition analysis subject attracts attention as the most studied subject. Possible reasons for composition analysis to be mainly chosen as the subject can be listed as follows: performance-based programs are run especially in conservatories; students are curious about the composition pieces they have been playing and they need to identify it; or, students take previous thesis subjects as model for their thesis depending upon the lack of original subject. Such situation increases the repetition of the same subject under different names, and limits the subject variety in the field. In faculties of education, compared to conservatories, subjects related to school and education such as "guitar in school music", "teaching methods", "guitar history", and "guitar techniques" are studied more; and also variety in thesis subjects is more. In a sense, such difference between conservatory and faculties of education reflects that both institutions' functions and missions are important factors in subject choice.

In the analyzed theses, it is observed that mostly qualitative research method is preferred as the method. Further use of qualitative method results from the fact that "composition analysis" subject is studied in theses. Again as research pattern, mostly descriptive pattern is used which is parallel with one of the recent study results (Yalçın, 2010), and later respectively raster pattern and experimental pattern are used. These are respectively followed by case study, action research, and composite pattern. However, other experimental and comparative studies, in which different guitar teaching methods are used or different methods are compared, are also needed.

As another finding of the research, it is observed that in

Table 9. The Distribution of data analysis methods.

Data analysis method	N	%
Descriptive Statistics (Arithmetic Mean, Standard Deviation, Frequency, Percentage)	71	79.78
T-Test	5	5.62
Anova/Ancova	6	6.73
Nonparametric	5	5.62
Other (Reasoning, Document Analysis, Regression)	2	2.25
Total	89	100

almost half of the analyzed theses (46%), especially in document-transcript review studies, study groups that form the sample are not concretely specified. It is seen that documents or works analyzed in work analysis studies are not taken into consideration as target population and sample. Apart from that most studied sample groups continue as “university students” and “instructors”. Selçuk et al. (2013) indicate that researchers mostly choose groups such as postgraduate students since they are easy to access; and, it shows similarity with this study’s finding that university students are preferred more as sample. The fact that researchers do not much tend to sample groups that are hard to access, such as performers who perform in the field of guitar, music teachers who work in schools, or trainee students, limits the variety and function of the studies in this field.

In the conducted studies, it is observed that document tools such as music notes, books, and websites are most used as data collection tools; and, they are followed by techniques such as surveys, tests, and meetings. It takes attention that multi data collection tools, which use several observations and techniques together, are used in limited numbers. Kılıç (2010) states in her analysis on general music education that “survey” technique is used more. Such findings lead us to think about the fact that both in general music education and in instrument training fields including guitar, researchers are limited with regard to use and develop a set of tests and techniques that are structured as data collection tools. In a similar way, it is observed that among descriptive statistical techniques used in data analysis, one-way analysis of variance, t-test, and non-parametric analysis are used. This finding shows similarity with Tebiş and Okay (2013)’s finding that descriptive statistical techniques are used more in theses about violin and viola. It is observed that studies with experimental methods are represented in far less numbers. It is clear that in guitar theses, comparative subjects, experimental subjects, and multivariate techniques are not used; therefore, analyses are made with preliminary techniques. To overcome such problems: (i) Literature review, which has significantly made progress throughout the world, should be effectively used and by keeping up with this progress, subject orientation

should be varied. (ii) Researchers should tend to studies that allow composite methods and experimental methods in theses. (iii) Study groups should be varied; and, sample should be chosen with regard to the research pattern. (iv) In more advanced levels, getting into research that require statistical analysis will help the field to gain depth. (v) Such kind of quality research should be conducted at regular intervals to periodically keep track of the developments observed in the field.

Conflict of Interests

The author has not declared any conflicts of interest.

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Full Length Research Paper

Factors affecting higher order thinking skills of students: A meta-analytic structural equation modeling study

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The purpose of the research is to develop and identify the validity of factors affecting higher order thinking skills (HOTS) of students. The thinking skills can be divided into three types: analytical, critical, and creative thinking. This analysis is done by applying the meta-analytic structural equation modeling (MASEM) based on a database of 166 primary empirical studies. The research results assert the theories and bring conceptual and empirical clarity to the factors affecting HOTS of students and also give readers an understanding of the magnitude and significance of relationships among the variables in the model. MASEM results confirm that classroom environment, psychological and intellectual characteristics of students have direct effects on HOTS (96.8% explained variance). Whereas, the family characteristic had insignificant effects on HOTS but they had indirect effects on HOTS through psychological characteristic. Furthermore, we show that the most direct effects on HOTS were psychological characteristic, classroom environment and intellectual characteristic, respectively. This study provided a holistic view on the relationship of factors affecting HOTS and proposed a direction for future research and practice.

Key words: Higher order thinking skills, meta-analytic structural equation modeling, classroom environment, family characteristic, psychological characteristic, intellectual characteristic.

INTRODUCTION

Higher Order Thinking Skills (HOTS) is a thinking process, which consists of complicated procedures and needs to be based on various skills such as analysis, synthesis, comparison, inference, interpretation, assessment, and inductive and deductive reasoning to be

employed to solve unfamiliar problems (Smith, 1992; Zohar and Dori, 2003). The characteristics of students with HOTS are open-mindedness for risk-taking, curiosity, keen on fact discovery, planning and indicating the most suitable method, have a systems thinking process, think

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carefully, use evidence to think rationally and frequent self-monitoring (Shari et al., 1993). The students with HOTS are able to create new knowledge and make appropriate and logical decisions. Information and technology advancement greatly influences the current society. Consequently, learning management must be adapted to the current situation/society and focus on improving HOTS of students.

There are many concepts of HOTS applied to the educational development of students and these concepts have been studied for years and used for teaching and learning in the classroom and the research of factors contributing to students' HOTS development (Noble and Powell, 1995; Rajendran, 2001; O'Tuel and Bullard, 2001; Marshall, Robert and Horton, 2011; Magno, 2011; Fischer et al., 2011; Kondak and Ayden, 2013). Within the thinking process literature, there are many factors affecting HOTS: classroom environment, family characteristic, psychological characteristic, and intelligence (Horan, 2007; Silvia, 2008; Pannells and Claxton, 2008; Lim and Smith, 2008; Chini et al., 2009; Pascarella et al., 2013; Fearon et al., 2013; Lather et al., 2014). These factors are related and mutually supported. Thus, the aforementioned factors should be included in the teaching model, which will be of benefit in supporting and promoting the development of HOTS. However, despite more than a decade of studies in this area and a variety of models proposed to explain the factors affecting HOTS, the extant factor affecting HOTS literature remains as follows; 1) the lack of systematic integration among those variables, 2) the researcher can not specified all relationships by a theory needed to be included in each primary study 3) some relations that are inconsistent or contradict one another across studies (Montea and Siu, 2002; Brink, 2003; Cheung and Chan, 2005; Montazemi and Hamed, 2015). It is difficult to draw conclusion from these studies. Hence, it is necessary to have a summary of research findings of the increased studies, variety of concepts on factors affecting HOTS. These will be studied further for a clear conclusion and a similar direction to get the most benefit from the information and to develop the most effective practical application. A systematic meta-analysis is likely to help us solve these problems.

For the research methodology of data collection and conclusion, the researcher employed a research synthesis method to data collection and applied statistical procedures to draw conclusion and solutions of the problems (Light and Pillemer, 1984). During the first stage, the descriptive method, traditional vote-counting methods and commutation of p-values are used for quantitative synthesis. Later, the meta-analysis is used by integrating the effect size to the analysis process to acquire better synthesis results and to delete the disadvantages of traditional synthesis which give subjective results (Kulik and Kulik, 1989). More recently,

the meta-analytic structural equation modeling approach (MASEM) has been developed for advanced statistics from more complex variance models which give research conclusions in terms of the causal relationship from different research. This also resulted in affirming or denying the theoretical relationship structure. Moreover, it will provide a powerful means for testing broader, richer, and more complex theories that are unlikely to be feasibly tested in any single primary study (Viswesvaran and Ones, 1995; Hunter and Schmidt, 2004). Additionally, the research results indicated a causal relationship model of both direct and indirect effects in real situations (Bamberg, 2007; Yu and Chiu, 2007). In conclusion, the research indicates that the MASEM is more practical and informative than the traditional meta analytic method.

From the problems and major issues mentioned above, it is obvious that there has not been conclusion from analyzing the factors affecting HOTS by applying MASEM in Thailand. The problems could be caused by the following; 1) unfamiliarity with the analysis method, 2) few applications for education and 3) some factors are overlooked. Moreover, some repeated problems are caused by education systems and policies, which reflect the limitations of research analysis due to the same results provided with no differences, thus the result of research database is not enough to analyze by MASEM (Borenstein et al., 2009). Therefore, the author is aware of the advantage and the application of MASEM and HOTS for research in human and social sciences. Consequently, the educationists use the information to determine what factors directly resulted in HOTS development and what elements relate to them. The outcomes of this analysis will contribute to effective development of students' HOTS. Additionally, it is also considered to be an extension of the knowledge application of MASEM analysis for the future studies.

LITERATURE REVIEW

Higher order thinking skills; HOTS

The definition of HOTS is the ability and expertise to find answers or achieve target goals through various forms of thinking processes. It is necessary for students to learn and practice this ability in order to acquire answers, to make decisions, and to solve problems (Lewis and Smith, 1993; King et al., n.d.). Educators have an assortment of HOTS that include several concepts. Krulik and Rudnick (1993) state that HOTS includes 1) recall thinking, 2) basic thinking, 3) critical thinking, and 4) creative thinking. Byrnes (1996) classifies HOTS into 4 levels; 1) the application level, 2) the analysis level, 3) the synthesis level, and 4) the evaluation level. Anderson and Krathwohl (2001) propose the concepts of Bloom's Taxonomy Revised, and classify cognitive approaches to learning

into six levels; 1) remembering, 2) understanding, 3) applying, 4) analyzing, 5) evaluating, and 6) creating. Based on the national standards of educational management and basic curriculum of Thailand, the key of these concepts related to HOTS development are the main focus for the development of characteristics in students' thinking skills. Moreover, they are the variables the author use in this study; 1) Analytical thinking: AnT is the ability of individuals to classify objects logically, assessing the relationships of certain elements, how they contribute, how they relate to each other, how they work, and what the most important parts are (Bloom et al., 1956; Marzano, 2001). 2) Critical Thinking: CriT refers to the ability to evaluate and consider things by searching for reliable and sufficient information before making decisions, solving problems, evaluating situations and taking action on any tasks with the most appropriate and accurate ways (Ennis, 2002; Black and Black, 2006; Ellis, 2009). 3) Creative Thinking: CreT refers to thinking competency in using previous knowledge to create new knowledge for discovering or innovating new things. This often results in more valuable outcomes, which can be used or applied to problem solving or effective performance (Sternberg and Lubart, 1999; Harvey, 2010).

Meta-analytic structural equation modeling; MASEM

Meta-analytic structural equation modeling (MASEM) is the most recently developed quantitative synthesis technique, which combines two research methodologies. Meta – analytic (MA) is the statistical analysis of analysis results from individual studies for the purpose of integrating the findings in form of effect size. Structural equation modeling (SEM) is a technique used to verify or test theoretical causal models (Glass, 1976; Hunter and Schmidt, 2004; Cheung, 2008). For the first phase, meta-analysis was synthesized to draw a conclusion of the effect size as an index of the direction and magnitude of the association between two variables, which includes Pearson correlations (r) and standardized mean difference (g). In order to conclude the effect size of more complex variables, the effect size on a series of correlation matrices is used to create a pooled correlation matrix, which can then be analyzed using SEM (Viswesvaran and Ones, 1995; Shadish, 1996; Cheung and Chan, 2005; Hafdahl, 2009).

Landis (2013) states that there are at least two primary approaches that serve as a foundation for integrating MA and SEM. 1) The analysis model proposed by Viswesvaran and Ones (Colquitt et al., 2000; Earnest et al., 2011; Robbins et al., 2009) is applied when no study provided full information of all variables indicated in the models. 2) The two-stage SEM (TSSEM) proposed by Cheung and Chan (2005) is a preferable alternative for

the author to apply when there is at least one study provided full information. In the present paper the author conducted MASEM by following a two-stage procedure of Viswesvaran and Ones (1995), which was considered to be the most suitable method for the data in this study. The concepts of analysis consist of two models that have continuous processes related to each other: the measurement model and the casual model. The five steps of the measurement model for theory testing are 1) identifying important constructs and relationships, 2) identifying different measurements used to operationalize each construct, 3) indicating all relating statistics and all of their importance in of studies, 4) processing the meta-analyzing and estimating the real value of the relationship of the measurement, 5) using factor analysis to test the measurement models. For casual models, there are the processes of measurement as following: 6) estimating the correlation value between structures from different structures, and 7) using path analysis with the estimated true value of correlation to test the proposed theories.

Classroom environment; ClEnv

The previous studies of classroom environment revealed the factors affecting the environment to enhance the effective teaching and learning processes are learning achievement, desirable characteristics of students, and processes of skill development including HOTS (Brown and Freeman, 2000; Dorman, 2002; Fisher and Khine, 2006; Wolf and Fraser, 2008; Galton et al., 2009; Pascarella et al., 2013). Even there were results indicating that factors concerning classroom environment were differed and variety, but from the author synthesis the variables of classroom environment affecting HOTS can be divided into three factors; 1) Classroom climate; ClCli refers to learning environment for both physical atmosphere such as tidiness, cleanliness, light, and size, and psychological atmosphere such as safety, warmth and good relationship, and freedom in expressing ideas and feelings (Moos, 1979; Dunn and Dunn, 1992; Brand et al., 2003; Ambrose et al., 2010; Wanekezi and Iruloh, 2012)., 2) Teaching and learning methods; TeM refers to principles, methods, patterns, and techniques that teachers apply to manage students' learning and to achieve classroom management goals (Jones et al., 1987; Alberta Learning, 2002)., and 3) Teacher behavior; TeB refers to the actions of teachers in classrooms to motivate, facilitate, and encourage students for performing their efficient works (Dorman, 2009).

Family characteristic; FaCh

Family is a basic social unit where parents insert their love, cares, values, attitudes, and life experiences for

students. Therefore, this factor is considered a foundation for every dimension of students' development as well as an influent element affecting students' learning outcomes and thinking skills, which showed the individual differences (Jackson, 2003; Wade, 2004; Campbell and Gilmore, 2007). Regarding the previous studies, the results show that there are two major factors of the family characteristic; 1) Democratic parenting style; Dmo refers to the method used by parents to take care of their children informally, but remain the rules with reasonably and democratically acceptances (Baumrind, 1966; Maccoby, 1992; Steinberg, 2001)., 2) parental support; Sup refers to the assistance, support, encouragement, and conveniences provided to children to live and learn including the learning environment to enhance students to gain new experiences and develop more advance skills (Ghate et al., 2000; Patricia et al., 2004).

Psychological characteristic; PsyCh

The psychological characteristic refers to the personality trait or behavioral characteristic which affects the learning strategy and the thinking process of individual to express students' feelings to contribute to their different learning and thinking skills (Lahey, 2001; Sternberg and William, 2001; Woolfolk, 2004; Santrock, 2009). The studies show that the two major factors of psychological characteristic are 1) Attitude toward learning; Atti refers to the student's ability to show satisfaction, and the agreement and disagreement toward classroom environment, teachers, learning activities, classmates and curriculum (Zimbardo, 1999; Bernstein et al., 2006)., 2) Achievement motivation; Moti refers to students' willingness, intention, enthusiasm, and attempt to achieve learning objectives with high performance (McClelland, 1961; Woolfolk, 2004)., and 3) Internal locus of control; Loc refers to students' self-awareness competency in working and achieving the goals, or even when they fail on their tasks, they keep their focus and effort to be successful (Rotter, 1990; Stajkovic and Luthans, 2003).

Intellectual characteristic; IntCh

According to the literature reviews, the findings show that intellectual characteristic also covers intellectual competency, solving problems and reasoning to change learning behavior, and differences of thinking process skills of individuals (Kane et al., 2004; Kim, 2005; Horan, 2007; Silvia, 2008). The results of synthesis show two major factors of intellectual competency, which are 1) Intelligence quotient; IQ refers to competency in learning, solving problems, and adjusting to new environments and problems (Feldman, 1992; Woolfolk, 2004)., 2) Reasoning abilities; Reas refers to the ability in transferring previous

knowledge to new experiments through thinking processes, solving problems, and finding relationships of things to make decisions based on the current information and problems (O'Daffer, 1990).

Objective

To develop and assess the validity of a structural equation model of factors affecting HOTS through meta-analytic structural equation modeling.

Hypothesis

The research hypotheses are given in Table 1. The theoretical models of the factors affecting HOTS are shown in Figure 1.

RESEARCH METHODOLOGY

To identifying the studies relevant for our MASEM consisted of using the internet search from ThaiLis Digital Collection and the electronic theses online system of 71 higher education institutions of Thailand. The studies are composed of quantitative research, experimental and correlational research, which focus on factors relating to the family characteristic, the intellectual characteristic, the psychological characteristic, and the classroom environment, which affect students' HOTS. The thinking skills consist of three factors; analytical thinking, critical thinking, and creative thinking published during 1999-2013, which was the period when the Thai educational system was renovated and there was more emphasis on students' thinking skills development. Search keywords include the following terms: 1) classroom climate, 2) teaching and learning methods, 3) teacher behavior, 4) democratic parenting style, 5) parental support, 6) attitude toward learning, 7) achievement motivation, 8) internal locus of control, 9) intelligence quotient, 10) reasoning abilities, 11) analytical thinking 12) critical thinking, 13) creative thinking and 14) higher order thinking skills. The search initially yielded 300 primary studies from 35 educational institutions matching our keywords. The studies were then examined for inclusion in our study, using the inclusion criteria.

Selecting the studies

Not all the studies were appropriate for inclusion in our analysis. Rosenthal (1995) and Wolfswinkel et al. (2013) recommended that researchers should assess the quality of the primary studies before analyzing the establishing criteria for the inclusion of the primary studies by using a multiple-rater technique to evaluate data from the primary studies, and assessing inter-rater reliability. Therefore, the author processes the research as follows;

Inclusion criteria

The studies would be included in the present meta-analysis if it satisfied the following inclusion criteria. 1) At least two of the constructs included in our hypothetical model were analyzed in the studies. 2) The sample in each primary studies are the students of the government schools 3) Both bivariate Pearson correlations(r)

Table 1. Research Hypotheses and Supporting Literature

Research hypotheses	Supporting literature
H1: Classroom environment positively affects HOTS.	Brown and Freeman, 2000; Fleith, 2000; Galton et al., 2009; Chini et al., 2009; Pascarella et al., 2013
H2: Classroom environment positively affects psychological characteristic of students.	Ari and Eliassy, 2003; Bong, 2005; Patrick et al., 2007; Nelson and Debacker, 2008; Dorman, 2009; Baeten et al., 2013
H3: Classroom environment positively affects intellectual characteristic of students.	Blumenfeld et al., 1987; Zohar, 1994; Shield and Dockrell, 2008; Barkl et al., 2012; Pascarella et al., 2013
H4: Family characteristic positively affects HOTS.	Torrance, 1965; Miller and Gerard, 1979; Querido et al., 2002; Lee et al., 2006; Lim and Smith, 2008; Fearon et al., 2013
H5: Family characteristic positively affects psychological characteristic of students.	Ginsburg and Bronstein, 1993; Gottfried et al., 1994; Kellan, 2000; Hoang, 2007; Umo, 2013
H6: Family characteristic positively affects intellectual characteristic of students.	Dombusch et al., 1987; McGinn et al., 2005; Houtenville and Conway, 2008; Akinsola, 2011; Wang, 2014
H7: Psychological characteristic positively affects HOTS.	Richmond and Serna, 1980; Amabile et al., 1990; Moneta and Siu, 2002; Pannells and Claxton, 2008; Lather et al., 2014
H8: Intellectual characteristic positively affect HOTS.	Mednick and Andrews, 1967; Plucker and Renzulli, 1999; Sternberg and O'Hara, 1999; Kane et al., 2004; Kim, 2005; Horan, 2007; Silvia, 2008

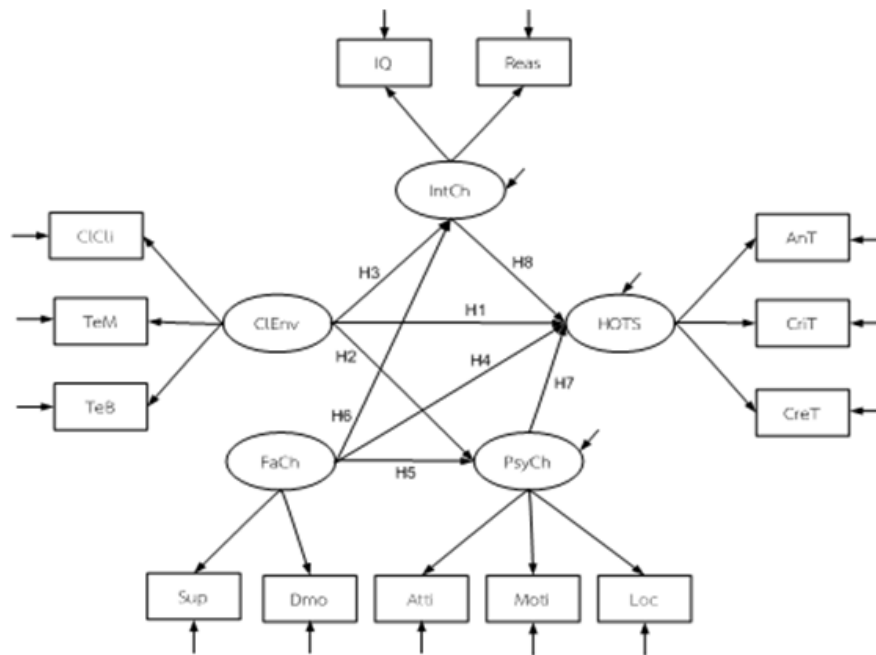


Figure 1. The theoretical model of the factors affecting higher order thinking skills.

and sample size were reported in the studies. 4) The sufficient data to compute effect sizes according to Glass' formula were reported in the studies. Abstracts of these papers were examined in greater detail. After closer inspection of the full papers, only 166 studies from 22 educational institutions satisfied all the above criteria and were retained to create a pooled correlation matrix for the MASEM analysis.

Intercoder reliability

The author examined all collected primary studies and recoded information on each study's demographic and substantive features

to ensure the literature search processed reliability (Cooper and Hedges, 1994).

The studies were coded by 3 authors independently, consisting of two research advisers and the author, reaching an intercoder agreement of 95%. The level of agreement reached was highly satisfactory. Disagreements in coding were resolved through discussion for consensus.

Data analysis

Two steps of Viswesvaran and Ones (1995) were employed for this

MASEM:

In step 1; the addition of the pooled correlations matrix based on Hedges and Olkin (1985) method consisted of three steps; 1.1) Transformed correlation coefficients into a standard normal metric using Fisher's r-to-Z transformation before calculating a weighted average of these transformed scores in fixed-effects model. (Fisher, 1921; Hedges and Olkin's, 1985) 1.2) Next, we tested the homogeneity of correlations from 1.1. Hedges and Olkin's Q statistic was applied to test the homogeneity of the correlations for each component. The fixed-effects model is appropriate for calculating the pooled correlation matrix when the heterogeneity tests are insignificant. Whereas, the random-effects model is proper when these tests indicate heterogeneity (Hedges and Vevea, 1998; Hunter and Schmidt, 2004). 1.3) After that, we transformed the weighted average Fisher's Z-to-r correlation for each pair of all variables back to the standard correlational form to the more interpretable effects size for reporting. This resulted in a matrix of meta-analytic correlations between all variables in the hypothetical model. The Comprehensive Meta-Analysis computer program was used to perform the data analysis (Borenstein et al., 2009)

In step 2 of the MASEM, the pooled correlation matrix by the true-score population effect sizes of the variable pairs was subjected to the SEM technique using the Mplus version 7. The criteria for assessing the validity of a structural equation model was a very good fit with the empirical data from the primary studies composed of the Comparative fit index; CFI, the Tucker - Lewis index; TLI, the Standardized root mean squared residual; SRMR, and the Root mean squared error of approximation; RMSEA. The goodness of fit statistics from structural validity shows that very good fitting model were CFI and TLI $\geq .95$ SRMR and RMSEA $\leq .05$ (Mclachlan and Pell, 2000; Muthén and Muthén, 2009; Byrne, 2012). For model sample size, we followed the recommendation of Viswesvaran and Ones (1995) to use the harmonic mean as the appropriate sample size because it tends to yield the least biased estimates of standard errors of parameter estimates.

RESULTS

Description of studies

Studies included in the meta-analysis were highly variable in terms of sample sizes that ranged from 411 to 30,163. The harmonic mean of the sample sizes was 655. For each effect size, the author used the following criteria to assess the effect size magnitudes: small ($r < 0.30$), moderate ($0.30 \leq r < 0.50$), and large ($r \geq 0.50$) (Cohen, 1988).

Among the 78 average weighted correlations obtained in the fixed effect model varied from small to large (0.060 to 0.669); a majority of correlations (40 out of 78) was the moderate, 25 correlations was the small, and 13 correlations was the large. Lower- and upper- bound effect sizes for confidence intervals of fixed effect model ranged from -0.003-0.683. In the random effect model, the effect size varied from small to large (0.060-0.576), a majority of correlations (48) was the moderate, 26 correlations was the small, and 4 correlations was the large. Lower- and upper- bound effect sizes for confidence intervals of random effect model ranged from

-0.003-1.958 (show in Appendix A).

Results of the validity of a structural equation model of factors affecting HOTS

According to the pooled correlation matrix of a structural equation model of factors affecting HOTS consisted of 78 effect sizes in the matrix (show in Appendix B). The result of the initial path analysis showed that the model was a very good fit with the empirical data from the primary studies with $\chi^2 = 0.035$, $df = 5$, $p\text{-value} = 1.000$, $TLI = 1.025$, $CFI = 1.000$, $SRMR = 0.001$, $RMSEA = 0.000$ (Table 2).

Results of the validity of a structural equation model of factors affecting HOTS are shown in Figure 2.

In accordance with Table 2 and Figure 2, the direction of effects is summarized as follows:

Direct effect factors are as follows.

The finding showed that three-fourths of the path of factors directly affecting HOTS significantly affected HOTS. The psychological characteristic (H7: 0.762**) indicated a higher effect size than the classroom environment (H1: 0.380*) and double in the intellectual characteristic (H8: 0.363*). The three latent factors explain the variance of 96.8%. However, the family characteristic insignificantly affected HOTS. Therefore, the study of the contribution of the psychological characteristic will enhance students' HOTS more than the classroom environment, and double in the intellectual characteristic. If we compare the results with the family characteristic, the findings indicated a 7 times higher development in students' HOTS.

The classroom environment (H2: 0.521**) had significant direct effects on the psychological characteristics equal to the family characteristic (H5: 0.414**). Therefore, in order to study or research, the development of students' psychological characteristic must focus on the enhancement of the classroom environment and the family characteristic. Even though the effect size of variable in the classroom environment was higher, the result indicated that the variable of the psychological characteristic must be equally focused on.

The factors that directly affected the intellectual characteristic consisted of the classroom environment (H3 : 0.457**), which showed a higher value more than twice of the family characteristic (H6 : 0.208*). It can be concluded that, study in the contribution of the classroom environment will enhance students' intellectual characteristic more than twice of the family characteristic.

The four paths of indirect factors affecting HOTS are as follows.

The family characteristic indirectly affected HOTS through the psychological characteristics of students (0.315**).

Table 2. Direct effects, indirect and total effects of the factors in structural model

Hypothesis	Variable		Direct Effects			Indirect Effects			Total Effects		
	DV	IV	Est.	S.E.	Z	Est.	S.E.	Z	Est.	S.E.	Z
H 1	HOTS	CIEnv	0.380*	0.179	2.125	-	-	-	-	-	-
-	HOTS	CIEnv to IntCh	-	-	-	0.166**	0.080	2.079	0.943**	0.139	6.804
-	HOTS	CIEnv to PsyCh	-	-	-	0.397**	0.142	2.803	-	-	-
H 4	HOTS	FaCh	-0.275	0.237	-1.161	-	-	-	-	-	-
-	HOTS	FaCh to IntCh	-	-	-	0.076	0.053	1.425	0.115	0.141	0.817
-	HOTS	FaCh to PsyCh	-	-	-	0.315*	0.155	2.037	-	-	-
H 7	HOTS	PsyCh	0.762**	0.288	2.650	-	-	-	0.762**	0.288	2.650
H 8	HOTS	IntCh	0.363*	0.160	2.271	-	-	-	0.363*	0.160	2.271
H 2	PsyCh	CIEnv	0.521**	0.084	6.220	-	-	-	0.521**	0.084	6.220
H 5	PsyCh	FaCh	0.414**	0.089	4.627	-	-	-	0.414**	0.089	4.627
H 3	IntCh	CIEnv	0.457**	0.082	5.567	-	-	-	0.457**	0.082	5.567
H 6	IntCh	FaCh	0.208*	0.098	2.115	-	-	-	0.208*	0.098	2.115

Notes: $\chi^2 = 0.035$, $df = 5$, $\chi^2 / df = 0.007$, p-value = 1.000, CFI = 1.000, TLI = 1.025, SRMR = 0.001, RMSEA = 0.000, $R^2(\text{HOTS}) = 0.968$, * $p < .05$, ** $p < .01$.

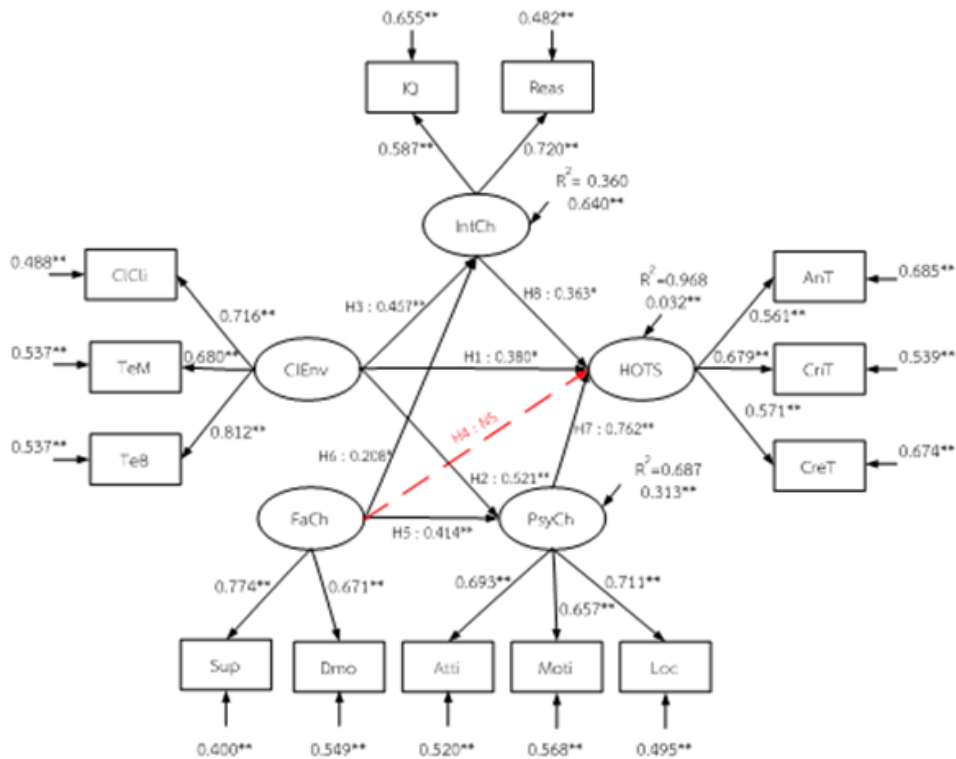


Figure 2. Results of the MASEM for a structural equation model of factors affecting HOTS.

Example of the value of indirect effects ($0.414 \times 0.762 = 0.315$) was developed by two paths. 1) The family characteristic had a direct effect on the psychological

characteristic of students (H4: 0.414**). (2) The psychological characteristics of students directly affected HOTS (H7: 0.762**). In conclusion, the family characteristic

affects the improvement of the psychological characteristics and will enhance students' HOTS.

The family characteristic had insignificant indirect effects on the intellectual characteristic. The study indicates that study or research in the contribution of the family characteristic affects the improvement of the intellectual characteristic will not enhance students' HOTS.

The classroom environment indirectly affected HOTS through the psychological characteristics of students (0.397**). It is concluded that the classroom environment positively affects the psychological characteristics and also increases students' HOTS.

The classroom environment indirectly affected HOTS through the intellectual characteristic (0.166**). In conclusion, the study shows that the classroom environment positively affects the intellectual characteristic and enhances students' HOTS.

DISCUSSION

This study brings conceptual and empirical clarity to the factors affecting HOTS based on the MASEM method. Our study makes four major contributions to theory, as follows.

The psychological characteristic, the classroom environment, and the intellectual characteristic of students directly affect HOTS, which supports the hypothesis. However, the family characteristic insignificantly affects HOTS. The result may be caused by the development of the hypothesis, which determined only direct effects. When this path included in the model had a variety complex variables, it did not support the hypothesis (Ali and Hamed, 2015). The psychological characteristic had effects on HOTS more than any other. This may be explained because these variables can be continuously developed by various techniques of the learning process, the classroom environment, and parents' support (Hoang, 2007; Dorman, 2009; Baeten et al., 2013; Umo, 2013).

The classroom environment and the family characteristic directly affect the intellectual characteristic, which supports the hypothesis. Morris and Maisto (2002) assert that the elements of social environment affect the intellectual characteristic. The classroom environment and the family condition are considered to be parts of the social environment. Additionally, this study found that the classroom environment has more than twice an effect of the family characteristic. This may result from the classroom environment and learning management that aim to encourage students to learn and develop their intellectual characteristic. Moreover, classroom management can design situations or experiments practice students thinking skills in various ways during the period of learning (School Drug Education and Road Aware, 2013).

The psychological characteristic of students is an important mediator variable for HOTS. The study indicates two indirect effects through students' psychological

characteristic: the classroom environment and the family characteristic. The results may be caused by the attribute of SEM analysis that able to analyze various effects including direct effect, moderating effect, and reverse effect. These also allow to identify linear and additive relationships of recursive and non-recursive model, as well as indirect effect through the mediator variable (Schumacker and Lomax, 2010; Barbara, 2012). The result of this research shows that the classroom environment has more an indirect effect than the family characteristic. The results may be caused by the effective instructional management, which benefits in organizing classroom environment to support the feelings, attitudes, knowledge, and thinking skills of students (Nelson and Debacker, 2008; Chini et al., 2009; Pascarella et al., 2013).

The family characteristic had insignificant indirect effects on the intellectual characteristic. The results may be because the intellectual characteristic had several effects on both the classroom environment and the family characteristic. When this path included the complex model, it did not support the hypothesis. However, the family characteristic is also an important factor that is indirectly affected through the psychological characteristic and increases students' HOTS.

Conclusion

Within the organizational literature, the study of factors affecting HOTS has been conducted for many years. Researchers have chosen to study a variety of variables and proposed a variety of models based on their individual interests, and there is no systematic integration among them. Moreover, some research findings are inconsistent with other studies and have become difficult to draw conclusions from the literature reviews. To solve these problems, this study collects the variables affecting HOTS to synthesize and find the conclusion for MASEM. This research contributes systematic integration among the variables. The research findings confirm the concepts, theories and importance of factors based on the structural equation model of factors affecting HOTS. The model is systematically designed from various concepts and theories of HOTS, which makes powerful and strong results and gains a boarder conclusion than the conclusions of one single primary study (Hunter and Schmidt, 2004). Moreover, this study extends the concept of research synthesis by using advanced statistics to behavioral and social sciences study.

Suggestions

On the basis of the results of this study, we have several suggestions for future research and practical applications;

1. The findings indicate that the classroom climate, teaching and learning methods affect HOTS of students.

Additionally, the psychological factor should be considered and applied to the classroom environment. For example, with the positive learning activity management, the classroom climate should support positive thinking in learning, teaching behavior or personalities of teachers to support an attitude toward learning. Techniques to motivate students to learn and express ideas can enhance HOTS of student as well.

2. The democratic parenting style and support of the family will help students improve their attitudes towards learning, achievement motivation, and self-trust, which will affect HOTS. Therefore, the parents should take care of their children closely and fairly, and provide students with an opportunity to share their ideas, make decisions, and solve problems. Additionally, the parents should encourage their children to participate in activities in and out of the classroom.

3. There are many studies on social science, which contain various models and variables. It is possible to synthesize those variables and make conclusions. This strategy extends the limit of the study of some variables in social science study. However, even this research got the conclusion. Future research may apply this information for research and development in practice such as development of learning strategy for contributing to students' HOTS. It is possible to apply the MASEM, which will not only develop students' HOTS, but also to extend the area of the MASEM study. Additionally, this form of learning management, from research synthesis with the advance statistical method, will add more value to future research.

4. The results of Q statistics indicated that the heterogeneity among effect size across studies (Hedges and Olkin, 1985). Therefore, future research should investigate the sources of this heterogeneity through moderator analyses, and the limitation of the process must be considered on the possibility of sufficient (Lipsey, 1994; Card, 2012).

Conflict of Interests

The authors have not declared any conflicts of interest.

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Appendix A. Fixed-effect and Random-effect model of correlations between the variables in the model of factors affecting higher order thinking skills

r	k	N	Fixed-Effect Model		Random-Effect Model		Q(df)
			Weight r	CI 95%	Weight r	CI 95%	
TeM- CICIi	15	13641	0.550	0.538 - 0.561	0.487	0.401 - 0.564	533.815 (14)
TeB - CICIi	20	17387	0.380	0.367 - 0.393	0.390	0.265 - 0.501	1635.932 (19)
TeB - TeM	1	880	0.381	0.344 - 0.455	0.401	0.323 - 0.436	0.000
Sup - CICIi	8	5161	0.476	0.454 - 0.497	0.410	0.246 - 0.551	311.612 (7)
Sup - TeM	2	1123	0.540	0.498 - 0.580	0.405	-0.152 - 0.767	85.987 (1)
Sup - TeB	9	5073	0.405	0.383 - 0.428	0.371	0.188 - 0.53	416.133 (8)
Dmo - CICIi	17	12315	0.273	0.256 - 0.289	0.272	0.172 - 0.366	552.270 (16)
Dmo - TeM	12	9273	0.380	0.360 - 0.400	0.358	0.246 - 0.461	378.57 (11)
Dmo - TeB	9	5471	0.434	0.413 - 0.456	0.385	0.159 - 0.573	673.675 (8)
Dmo - Sup	1	411	0.520	0.507 - 0.637	0.576	0.445 - 0.587	0.000
Atti- CICIi	25	18008	0.411	0.399 - 0.423	0.376	0.301 - 0.445	782.346 (24)
Atti- TeM	9	6770	0.351	0.330 - 0.372	0.356	0.267 - 0.439	131.845 (8)
Atti- TeB	17	10368	0.437	0.420 - 0.452	0.424	0.308 - 0.527	759.667 (16)
Atti- Sup	15	13359	0.414	0.399 - 0.427	0.39	0.277 - 0.493	769.592 (14)
Atti- Dmo	16	15442	0.309	0.294 - 0.323	0.328	0.239 - 0.412	550.770 (15)
Moti - CICIi	23	16352	0.405	0.393 - 0.419	0.374	0.272 - 0.468	1191.321 (22)
Moti - TeM	10	7293	0.374	0.354 - 0.394	0.380	0.271 - 0.479	246.024 (9)
Moti - TeB	11	7076	0.428	0.409 - 0.448	0.402	0.294 - 0.501	278.029 (10)
Moti - Sup	9	6398	0.468	0.448 - 0.486	0.416	0.311 - 0.511	194.380 (8)
Moti - Dmo	18	15998	0.343	0.328 - 0.356	0.314	0.237 - 0.388	464.839 (17)
Moti - Atti	37	30163	0.444	0.435 - 0.453	0.419	0.36 - 0.476	1362.962 (36)
Loc - CICIi	17	12101	0.399	0.384 - 0.414	0.383	0.292 - 0.465	506.883 (16)
Loc - TeM	7	5095	0.304	0.279 - 0.329	0.306	0.174 - 0.427	146.969 (6)
Loc - TeB	11	6797	0.548	0.531 - 0.565	0.436	0.177 - 0.638	1414.000 (10)
Loc - Sup	7	5963	0.541	0.523 - 0.559	0.426	0.25 - 0.574	358.098 (6)
Loc - Dmo	16	13886	0.380	0.366 - 0.394	0.364	0.286 - 0.437	390.421 (15)
Loc - Atti	19	17857	0.373	0.360 - 0.385	0.354	0.262 - 0.439	840.497 (18)
Loc - Moti	19	17495	0.417	0.405 - 0.429	0.404	0.297 - 0.5	1164.873 (18)
IQ - CICIi	7	3738	0.212	0.181 - 0.242	0.239	0.016 - 0.439	285.942 (6)
IQ - TeM	1	810	0.153	0.086 - 0.220	0.154	0.085 - 0.219	0.000
IQ - TeB	1	528	0.453	0.420 - 0.550	0.488	0.382 - 0.518	0.000
IQ - Sup	1	971	0.060	-0.003 - 0.122	0.060	-0.003 - 0.122	0.000
IQ - Dmo	6	5125	0.194	0.167 - 0.220	0.150	-0.039 - 0.329	224.824 (5)
IQ - Atti	12	9656	0.267	0.249 - 0.286	0.291	0.292 - 0.409	469.773 (11)
IQ - Moti	14	10434	0.180	0.162 - 0.198	0.217	0.111 - 0.319	408.576 (13)
IQ - Loc	7	4759	0.397	0.372 - 0.420	0.377	0.148 - 0.568	438.936(6)
Reas - CICIi	14	9169	0.193	0.172 - 0.212	0.183	0.092 - 0.27	256.402(13)
Reas - TeM	7	3858	0.248	0.217 - 0.278	0.252	0.064 - 0.423	207.985 (6)
Reas - TeB	13	8576	0.424	0.406 - 0.441	0.338	0.135 - 0.515	1225.289 (12)
Reas - Sup	6	7985	0.278	0.258 - 0.299	0.260	-0.063 - 0.533	1072.127 (5)
Reas - Dmo	8	7421	0.239	0.217 - 0.261	0.226	0.108 - 0.338	168.861 (7)
Reas - Atti	18	17454	0.294	0.280 - 0.308	0.290	0.138 - 0.429	1886.054 (17)
Reas - Moti	10	9339	0.210	0.191 - 0.230	0.230	0.104 - 0.348	327.748 (9)
Reas - Loc	14	12565	0.478	0.464 - 0.491	0.399	0.212 - 0.558	1713.229 (13)
Reas - IQ	3	1701	0.205	0.160 - 0.251	0.272	-0.074 - 0.559	99.955 (2)
AnT- CICIi	17	11781	0.258	0.241 - 0.275	0.251	0.140 - 0.354	625.589 (16)
AnT- TeM	25	3856	0.437	0.411 - 0.463	0.546	0.425 - 0.649	489.619 (24)

Appendix A. cont'd

AnT- TeB	12	7993	0.505	0.488 - 0.521	0.426	-0.33 - 0.663	2608.866 (11)
AnT- Sup	3	1790	0.279	0.235 - 0.321	0.252	-0.03 - 0.498	73.060 (2)
AnT- Dmo	9	5637	0.223	0.198 - 0.248	0.244	0.067 - 0.405	377.386 (8)
AnT- Atti	27	17975	0.327	0.314 - 0.340	0.327	0.242 - 0.408	1026.142 (26)
AnT- Moti	24	15865	0.304	0.289 - 0.318	0.301	0.217 - 0.381	756.259 (23)
AnT- Loc	13	8496	0.404	0.386 - 0.422	0.377	0.139 - 0.573	1710.799 (12)
AnT- IQ	9	6428	0.550	0.532 - 0.566	0.506	0.378 - 0.616	333.424 (8)
AnT- Reas	11	6712	0.392	0.371 - 0.412	0.358	0.115 - 0.561	1140.852 (10)
CriT- ClCli	16	12183	0.244	0.227 - 0.261	0.219	0.141 - 0.296	303.052 (15)
CriT- TeM	24	6527	0.435	0.414 - 0.454	0.466	0.338 - 0.577	701.392 (23)
CriT-TeB	13	8088	0.584	0.569 - 0.598	0.306	-0.059 - 0.599	3397.708 (12)
CriT- Sup	5	4508	0.521	0.499 - 0.542	0.341	-0.109 - 0.675	947.090 (4)
CriT- Dmo	17	13234	0.304	0.289 - 0.319	0.250	0.152 - 0.343	544.581 (16)
CriT- Atti	12	9338	0.225	0.206 - 0.244	0.204	0.117 - 0.288	206.900 (11)
CriT- Moti	12	9388	0.23	0.211 - 0.249	0.235	0.111 - 0.352	428.627 (11)
CriT- Loc	19	14570	0.495	0.482 - 0.506	0.396	0.232 - 0.538	2213.088 (18)
CriT- IQ	4	3410	0.658	0.639 - 0.677	0.499	0.188 - 1.958	326.943 (3)
CriT- Reas	14	8730	0.573	0.558 - 0.587	0.431	0.254 - 0.580	1143.277 (13)
CriT- AnT	8	4820	0.483	0.461 - 0.504	0.382	0.110 - 0.601	628.668 (7)
CreT- ClCli	10	6068	0.669	0.655 - 0.683	0.394	-0.134 - 0.747	4187.565 (9)
CreT- TeM	28	4087	0.635	0.616 - 0.653	0.539	0.409 - 0.648	654.507 (27)
CreT- TeB	7	3723	0.439	0.413 - 0.465	0.410	0.175 - 0.601	382.131 (6)
CreT- Sup	9	8428	0.164	0.142 - 0.184	0.210	0.111 - 0.305	172.476 (8)
CreT- Dmo	4	1908	0.228	0.185 - 0.270	0.230	-0.071 - 0.493	133.339 (3)
CreT- Atti	12	9607	0.240	0.221 - 0.259	0.297	0.171 - 0.412	457.058 (11)
CreT- Moti	8	3766	0.260	0.230 - 0.289	0.263	0.036 - 0.464	364.394 (7)
CreT- Loc	3	2056	0.273	0.233 - 0.313	0.322	0.007 - 0.580	107.155 (2)
CreT- IQ	7	2934	0.372	0.341 - 0.403	0.297	0.019 - 0.531	358.273 (6)
CreT- Reas	5	5764	0.402	0.380 - 0.424	0.369	0.245 - 0.481	97.194 (4)
CreT- AnT	4	2015	0.427	0.390 - 0.462	0.319	-0.085 - 0.633	416.659 (3)
CreT- CriT	4	1910	0.498	0.464 - 0.531	0.380	-0.069 - 0.701	309.952 (3)

Notes: r = Correlation between the variables; k = Number of studies; N = Number of observations; Weight r = Weighted mean effect size; CI = Confidence intervals; Q = Chi-square test; highlight = Weighted mean effect size applied to the correlation matrix; ClCli = Classroom climate; TeM = Teaching and learning methods; TeB = Teacher behavior; Dmo = Democratic parenting style; Sup = Parental support; Atti = Attitude toward learning; Moti = Achievement motivation; Loc = Internal locus of control; IQ = Intelligence quotient; Reas = Reasoning abilities; AnT = Analytical thinking; CriT = Critical Thinking; CreT = Creative Thinking

Appendix B. Meta-analytic correlation matrix in the model of factors affecting higher order thinking skills

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CICIi	-												
	0.487(r)												
2. Lear	15	-											
	13641												
3. TeB	0.390(r) 20	0.381(f)											
	17387	1	-										
		880											
4. Sup	0.410(r)	0.405(r)	0.371(r)										
	8	2	9	-									
	5161	1123	5073										
5. Dmo	0.272(r)	0.358(r)	0.385(r)	0.52(f)									
	17	12	9	1	-								
	12315	9273	5471	411									
6. Atti	0.376(r)	0.356(r)	0.424(r)	0.39(r)	0.328(r)								
	25	9	17	15	16	-							
	18008	6770	10368	13359	15442								
7. Moti	0.374(r)	0.38(r)	0.402(r)	0.416(r)	0.314(r)	0.419(r)							
	23	10	11	9	18	37	-						
	16352	7293	7076	6398	15998	30163							
8. Loc	0.383(r)	0.306(r)	0.436(r)	0.426(r)	0.364(r)	0.354(r)	0.404(r)						
	17	7	11	7	16	19	19	-					
	12101	5095	6797	5963	13886	17857	17495						
9. IQ	0.239(r)	0.153(f)	0.453(f)	0.060(f)	0.150(r)	0.291(r)	0.217(r)	0.377(r)					
	7	1	1	1	6	12	14	7	-				
	3738	810	528	971	5125	9656	10434	4759					
10.Reas	0.183(r)	0.252(r)	0.338(r)	0.260(r)	0.226(r)	0.290(r)	0.230(r)	0.399(r)	0.272(r)				
	14	7	13	6	8	18	10	14	3	-			
	9169	3858	8576	7985	7421	17454	9339	12565	1701				
11. AnT	0.251(r)	0.546(r)	0.426(r)	0.252(r)	0.244(r)	0.327(r)	0.301(r)	0.377(r)	0.506(r)	0.358(r)			
	17	25	12	3	9	27	24	13	9	11	-		
	11781	3856	7993	1790	5637	17975	15865	8496	6428	6712			
12. CriT	0.219(r)	0.466(r)	0.306(r)	0.341(r)	0.250(r)	0.204(r)	0.235(r)	0.396(r)	0.499(r)	0.431(r)	0.382(r)		
	16	24	13	5	17	12	12	19	4	14	8	-	
	12183	6527	8088	4508	13234	9338	9388	14570	3410	8730	4820		
13.CreT	0.394(r)	0.539(r)	0.410(r)	0.210(r)	0.230(r)	0.297(r)	0.263(r)	0.322(r)	0.297(r)	0.369(r)	0.319(r)	0.380(r)	
	10	28	7	9	4	12	8	3	7	5	4	4	-
	6068	4087	3723	8428	1908	9607	3766	2056	2934	5764	2015	1910	

Notes: upper row = Weighted mean effect size; middle row = Number of independent correlation matrices obtained for each construct ; lower row =Total sample size obtained for each construct; (f) = Weighted mean effect size based on fixed-effects model, (r) = Weighted mean effect size based on random-effects model.



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