PSYCHOMETRIC PROPERTIES OF THE GEOGRAPHY ACHIEVEMENT TEST, GEOGRAPHY SELF EFFICACY SCALE, USM EMOTIONAL QUOTIENT INVENTORY AND THEIR RELATIONSHIPS

By

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DEDICATION

From the depth of my heart I dedicate this thesis to the virtuous soul of the warm-hearted person, my father, who departed from this life before the birth of this work. May Allah forgive him and grant him mercy and grace.

I lovingly dedicate this thesis to my first school, my mother who overwhelms me with her affection and compassion.

I sincerely dedicate this work to my gorgeous wife, my light in the dark nights, who supported me in each and every step of the way.

This work is dedicated to the source of my happiness in life, my children, Hudhifa, Nusaybah, Maria, Muhannad, Shayma and Asma. May Allah protect them and help them achieve their ambitions and hopes.

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LIST OF ABBREVIATIONS

CTT	Classical Test Theory
DIF	Deferential Item Functioning
EI	Emotional Intelligence
GA	Geography Achievement
GAT	Geography Achievement Test
GSES	Geography Self-Efficacy Scale
IRT	Item Response Theory
SCT	Social Cognitive Theory
SE	Self-Efficacy
SEM	Structural Equation Modeling
USMEQ-i	USM Emotional Quotient Inventory

CIRI-CIRI PSIKOMETRIK DARIPADA UJIAN PENCAPAIAN GEOGRAFI, SKALA EFIKASI KENDIRI GEOGRAFI, INVENTORI KECERDASAN EMOSI USM SERTA PERKAITAN ANTARA KETIGA-TIGANYA

ABSTRAK

Penggunaan instrumen dengan ciri-ciri psikometrik yang baik adalah penting bagi mendapatkan kesimpulan yang tepat tentang pencapaian pelajar serta faktor yang mempengaruhinya. Kajian ini bertujuan menilai ciri-ciri psikometrik tiga instrumen yang digunakan, iaitu Skala Efikasi Kendiri Geografi (GSES), Inventori Kecerdasan Emosi USM (USMEQ-i) dan Ujian Pencapaian Geografi (GAT). Di samping itu, kajian ini juga mengkaji perkaitan di antara Efikasi Kendiri Geografi, Kecerdasan Emosi dan Pencapaian Geografi dalam kalangan pelajar Gred 12 di Oman. Sampel kajian terdiri daripada 839 orang pelajar Gred 12 di dua daerah yang dipilih daripada 10 buah sekolah menggunakan pensampelan kluster. Data dikumpul menggunakan tiga skala, iaitu GSES, USMEQ-i, dan GAT. Data dianalisis menggunakan model pengukuran Rasch untuk menguji dimensi, statistik yang sesuai (fit statistics), keterbezaan fungsi ítem mengikut jantina (gender DIF) kategori respons, kebolehpercayaan, serta kesahihan instrumen tersebut. Di samping itu juga, teknik pemodelan persamaan berstruktur digunakan untuk menentukan perkaitan di antara Efikasi Kendiri Geografi, Kecerdasan Emosi dan Pencapaian Geografi. Dapatan kajian menunjukkan bahawa semua skala yang digunakan memenuhi andaian unidimensi. Semua item dalam setiap skala dan subdimensi menepati jangkaan model Rasch. Lima ketegori respons dalam GSES dan USMEQ-i boleh diterima. Terdapat item dalam setiap skala menunjukkan keterbezaan fungsi ítem. Indeks kebolehpercayaan ítem menunjukkan bahawa kebolehpercayaan bagi semua skala dan subdimensi adalah tinggi, sementara kebolehpercayaan individu adalah baik bagi semua skala dan rendah bagi sesetengah subskala, contohnya Skala Komitmen Emosi bagi USMEQ-i dan Skala Pemikiran Aras Tinggi bagi GAT. Peta item-individu bagi instrumen ini tidak menunjukkan sebarang jurang yang signifikan dalam taburan item GSES, sementara itu, ia menunjukkan satu jurang yang signifikan dalam USMEQ-i dan tiga jurang dalam GAT. Keputusan juga mendapati bahawa item dalam GSES dan USMEQ-i adalah mudah dan bukannya padanan yang baik bagi kebolehan pelajar. Dapatan daripada pemodelan persamaan berstruktur menunjukkan perkaitan-langsung yang positif dan signifikan di antara Kecerdasan Emosi dan Efikasi Kendiri Geografi dan di antara Efikasi Kendiri Geografi dan Pencapaian Geografi. Perkaitan –langsung di antara Kecerdasan Emosi dan Pencapaian Geografi adalah tidak signifikan. Sebagai tambahan, terdapat perkaitan – tidak langsung di antara Kecerdasan Emosi dan Pencapaian Geografi melalui Efikasi Kendiri Geografi ditemui. Berdasarkan dapatan tersebut, cadangan yang boleh diutarakan bagi manfaat penyelidikan akan datang, antaranya adalah meneliti semula skala ini dalam usaha untuk menambah baik ciri-ciri psikometrik; mencadangkan serta mengesahkan skala lain yang berkaitan dengan Kecerdasan Emosi dan Efikasi Kendiri dalam konteks Oman; dan mereplikasi kajian ini di Oman dengan tahap gred yang lain dan subjek sekolah yang berbeza.

PSYCHOMETRIC PROPERTIES OF THE GEOGRAPHY ACHIEVEMENT TEST, GEOGRAPHY SELF EFFICACY SCALE, USM EMOTIONAL QUOTIENT INVENTORY AND THEIR RELATIONSHIPS

ABSTRACT

To draw accurate conclusions about student achievement and its factors, it is very important to employ instruments with good psychometric properties. This study aimed to examine the psychometric properties of three instruments namely: Geography Self-Efficacy Scale (GSES), USM Emotional Quotient Inventory (USMEQ-i) and Geography Achievement Test (GAT). Additionally, this study aimed to examine the relationship among geography self-efficacy, emotional intelligence and geography achievement of 12th Grade students in Oman. Sample of the study consisted of 839 12th Grade students from two districts selected by cluster sampling from ten schools. Data were collected using three instruments: GSES, USMEQ-i and GAT. Data were analyzed by employing Rasch measurement model to examine dimensionality, fit statistics, gender DIF, response categories, reliability and construct validity of these instruments. Additionally, the structural equation modeling technique was used in order to examine the relationships among the geography self-efficacy, emotional intelligence and geography achievement. Findings showed that all scales in this study met the assumption of unidimensionality. All items in each instrument fit the expectation of Rasch model. The five response categories in GSES and USMEQ-i found to be adequate. Some items in each instrument showed gender DIF. Reliability indexes showed that the item reliability for all instruments and their sub-dimension was high, while the person reliability was good for over all instruments and low for some sub-dimensions such as Emotional Commitment from USMEQ-i and Higher Thinking Level from GAT. Person- item maps of these instruments did not show any significant gap in items distribution of GSES while it showed one significant gap in USMEQ-i and three in GAT. It also indicated that the items of GSES and USMEQ-i were easy and did not match the students' abilities well. Findings from structural equation modeling demonstrated significant and positive direct relationships between emotional intelligence and geography self-efficacy as well as between geography self-efficacy and geography achievement. The direct relationship between emotional intelligence and geography achievement was found to be not significant. Additionally, the indirect relationship between emotional intelligence and geography achievement through geography self-efficacy was discovered. Based on these results, future research recommendations include reviewing these instruments in order to improve their psychometric properties, validating other instruments related to emotional intelligence and self efficacy in the context of Oman, and replicating this study in Oman with other grade level and different school subjects.

CHAPTER ONE
INTRODUCTION

1.1 Introduction

A good assessment of students' achievement and a good measure of the factors that have an impact on it depends on the quality of the instruments that were used. These instruments should be developed and designed in order to provide dependable results about the performance of students and their psychological traits (Anderson & Morgan, 2008). Therefore, developing instruments with good psychometric properties can provide helpful information that can be used for making better decision about students, curricular and educational policy.

Students' achievement can be predicted by many external and internal factors. Internal factors are those which refer to each student as a unique person, and his mental, psychological and physical characteristics, whereas the external factors are those related to the students' environment, including home, school and their society (Papanastasiou, 2000). Marzano (2000) found that school-level and teacher-level factors accounted for approximately 20 percent of the variance in students' achievement whereas student characteristics, home environment, learned intelligence, background knowledge, and motivation accounted for 80 percent. Studies on the effects of internal factors such as emotional intelligence and self-efficacy on students' achievement in geography has been very minimal particularly in the context of Oman which motivated the need to carry out such a study.

In this current study, emotional intelligence and geography self-efficacy are studied as predictors of geography achievement of students' grade 12^{th} in Oman. The

basic step in this investigation is to use appropriate instruments that can give valid and reliable results about the relationships between these variables. Because of that the focus of the present study is in providing valid and reliable instruments to measure emotional intelligence, geography self-efficacy and geography achievement.

As Rasch measurement model currently represents the most measurement model that can used to construct objective scales in education and psychology (Bond & Fox, 2001), the present study implements this model in order to examine the psychometric properties of the instruments that use to measure geography achievement, geography self-efficacy and emotional intelligence.

1.2 Setting of the Study

This study applied in the context of Oman. The Sultanate of Oman lies on the Tropic of Cancer in the extreme Southeast corner of the Arabian Peninsula (Ministry of Information, 2010). It occupies a total area of about 309,500 square kms, covers a diverse range of topography, including mountain, deserts and fertile plains (Ministry of Information, 2010). The length of the Omani coast is 3,165 km from the Strait of Hormuz in the north; to the borders of the Republic of Yemen in the south and it overlook three seas namely the Arabian Gulf, the Oman Sea and the Arabian Sea. Oman shares borders with Saudi Arabia to the west, the United Arab Emirates to the North and the Republic of Yemen in the South-West (Ministry of Information, 2010).

The modern education in Oman has started in 1970 when His Majesty Sultan Qaboos ruled the country. The legal framework of education in Oman derived from

directives of His Majesty the Sultan and the policies specified by his government (Ministry of Education, 2004). In July 1995 the conference titled “Oman 2020 the vision conference for Oman’s economy” was convened. This conference reports that the country should achieve many goals by the year 2020. One of these goals is to have well-developed human resources.

Findings of this conference have become a part of the legal framework for the Ministry of Education. The Basic Statue of State which came in November 1996 is another important part of the legal framework of Education in Oman. Article 13 of Basic Statue, state that “Education is a cornerstone for the progress of society which the state foster and endeavours to spread and make accessible to all”(Ministry of Education, 2004, p.9). The five year plans also are another part of legal framework that considered by the Ministry of Education in developing educational system (Ministry of Education, 2004).

As a result of conference "Oman 2020" which was organized in 1995, and the "Basic Statute" which was issued in 1996, the Ministry of Education began in 1997 replace the three levels of General Education System (primary, preparatory, and secondary) with the Basic Education System. The Basic Education System covers 10 years from grade 1 to grade 10 and organized into two cycle: first cycle includes students aged 6 to 9 and second cycle includes students aged 9 to 15. Then post-Basic Education phase comes and consisted of grade 11^{th} and grade 12^{th} (Ministry of Education, 2004).

Basic Education in the Sultanate of Oman is the 10 years education that provided by the government to all the children in Oman at the age of education (Ministry of Education, 2004). It provides basic educational needs that related to knowledge, skills and values that enable students to continue their learning and training based on to their trends and abilities (Ministry of Education, 2008b). Basic Education also aims to provide students with competences and skills that enable them to face the challenges of the present and the future within the framework of the overall social development its outputs (Ministry of Education, 2008b).

After completing the stage of basic education, the students are expected to acquire enough knowledge, skills, abilities and values (Ministry of Education, 2008b). For example, the necessary Islamic sciences for their lives as Muslims, the basics of the Arabic language arts, appreciation of the Omani, Arab and Islamic heritage, the ability to cooperate, continue, search and inquire, competences to think scientifically, criticize, create, the skills of self-learning, a good knowledge of mathematics, sciences and computer skills (Ministry of Education, 2008b).

Post - Basic Education is a two-year of schooling that follows the stage of basic education (Ministry of Education, 2008c). It aims to continue to develop basic skills and job skills in order to prepare students to be active members of society, continue their higher education and work after school (Ministry of Education, 2008c). The curriculum in post- basic education provides students with essential skills through integrating the skills into core courses that taken by all students and in the same time enables them to choose courses that are appropriate for their varying abilities and interests (Ministry of Education, 2008c).

In order to evaluate and assess students' achievement in schools, Ministry of Education of Oman established the Educational Evaluation Department (Ministry of Education, 2008a). The new evaluation system in Oman uses various continuous assessment tools to assess the students' achievement (Ministry of Education, 2008a). Examples of these tools are: written work, projects, short research, quizzes, classroom activities, daily observation, practical performance, reports and other tools specified in the specification documents for each subject (Ministry of Education, 2008a).

The result of the students can be checked for whether it reflects the real level of achievement by using the portfolio and moderation. The portfolio is documentation where samples of student's written work are gathered and kept to be used as evidence of student's level of performance (Ministry of Education, 2011a). This portfolio can be used as reference for the teachers, principals and parents (Ministry of Education, 2011a).

Moderation means the following up process which takes place to ensure the right and accurate application of the continuous assessment tools and instruments according to each subject's specifications and how this reflects on students' results (Ministry of Education, 2011a). The moderation is classified into informal and formal categories. Informal moderation includes all grades and takes place throughout the whole year and must be done by teachers who could be assisted by senior teachers, principals, supervisors, senior supervisors, examination officers and others. Formal moderation targets grade 12^{th} only and conducts at the end of each

semester and it is done by a centralized team from the ministry with cooperation from the regions (Ministry of Education, 2011a).

1.3 Background of the Study

Secondary education in Oman has received a wide attention from Oman government. Significant efforts have been done by the Ministry of Education to develop this phase of education system (e.g. International Conference, 2002; Regional Seminar, 2005). This present study is in line with the interest of the ministry in upgrading the Omani secondary education, because it focuses on achievement of grade 12th students.

Grade 12th represents a great importance of education in Oman. It is a top of the pyramid in general education. Thus, the level of students' achievement and the skills that they have can be considered as a standard to evaluate the education system and determine its efficiency. Grade 12th is significant due to its being a turning point in student life; the result obtained by the student at this grade is often an important criterion in guiding his life either in the selection of specialization in higher education or the type of occupation or profession (Opertti & Brady, 2009).

The curriculum in Grade 11th and grade 12th is organized on a core and elective model and the students have the opportunity to choose any appropriate programs according to their abilities and interests. The core subjects are Islamic Studies, Arabic Language, Social Studies, English Language A, and English Language B. The option subjects include History, Geography, English Elective,

Biology, Chemistry, Physics, Sciences and Environment, Pure Maths, Applied Maths and Life Skills (Ministry of Education, 2008c).

Geography is one of the important subjects in Grade 12. The content of Geography includes a variety of topics aimed to improve the maps skills and the skills of dealing with modern geography devices and software (Ministry of Education, 2009a). Skills developed through this subject are expected to qualify students for higher education in the fields of Cartography Architectural Drawing, Geographic Information Systems, Surveying and Civil Engineering (Ministry of Education, 2008c). Therefore, this subject is expected to attract students with either science or arts abilities.

Statistics of Ministry of Education (2010) has indicated that there are a high percentage of students enrolled in this subject compare to other elective subjects. This high percentage might reflect the interest of the students to study geography and reflect the importance of this subject for students in 12^{th} grade. This is consistent with the report of Algharibi (2008), that students in Oman viewed social studies as interesting and important subject and Alnofli (2010), who reported that students in Oman have positive attitude toward geography.

Like other subjects, students' achievement in geography can be predicted by several external and internal factors, such as teacher (Buddin & Zamarro, 2009), family (Chiu, 2007; Papanastasiou, 2000; Tomul & Celik, 2009), school climate (Funkhouser, 2009; Narucki, 2008) and the students' personality traits (Komarraju,

Karau & Schmeck, 2009; Laidra, Pullmann & Allika, 2007; Steinmayr & Spinath, 2009).

Emotional intelligence is one of the internal factors that can predict the geography achievement of students. Salovey and Mayer (1990, p.5) defined emotional intelligence as "subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions". According to Mayer, Salovey, and Caruso (2000), person with high emotional intelligence is more likely to be able to solve emotional problems easier than a person with low emotional intelligence. Low and Nelson (2004), claimed that emotional intelligence can help students to achieve high grades in the school. In his book *"Working with Emotional Intelligence"*, Goleman (1998) argued that emotional intelligence can influence the individual life greater than cognitive intelligence. According to Lam and Kirby (2002), emotional intelligence of students is a better predictor of their performance than cognitive ability. Furthermore, students with high emotional intelligence can be successfully transferred from high school to university because emotional intelligence provides students with competencies that help them to adjust to the new atmosphere (Parker, Duffy, Wood, Bond & Hogan, 2005).

Most of the studies reported that there is a positive relationship between academic achievements and emotional intelligence; for example in mathematic achievements (Downey, Mountstephen, Lloyd, Hansen & Stough, 2008; Martin, 2010; Parnell, 2007;), in science (Downey et all, 2008;), in reading (Parnell, 2007;), in geography (Downey et al, 2008), in language (Downey et al, 2008;), in art

(Downey et al., 2008) and in general achievement (Abdullah, Habibah, Mahyuddin & Uli, 2004; Aremu, Tella & Tella, 2006; Brackett, Mayer & Warner, 2004; Drago, 2004; Holt, 2007; Marquez, Martin & Brackett, 2006; Parker, Creque, Barnhart, Harris, Majeski, Wood, Bond & Hogan, 2004; Rogers, 2010; Shammila, 2007; Wraight, 2007). Despite findings that emotional intelligence predicts students' achievement, some studies have failed to show a significant relationship between emotional intelligence and students' achievement (Bradshaw, 2008; Cyr, 2005). This means that more studies are needed to investigate the relationship between emotional intelligence and students' achievement of different school subjects and in different context.

Self-efficacy is another internal factor that can predict geography achievement. According to Bandura (1994, p.5), self-efficacy is "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives". Self-efficacy can increase students' motivation and able them to master challenging academic tasks and efficiently use of acquired knowledge and skills (Bandura, 1993). Students' beliefs in their efficacy can influence their academic goals and their final academic achievement (Zimmerman, Bandura, & Martinez, 1992).

Several studies have reported a positive relationship between self-efficacy and academic achievement but most of them focused on the general achievement or achievement of specific school subjects but none of them associated with geography. For example, self-efficacy is positively correlated with mathematic achievements (Ayotola & Adedeji, 2009; Chen, 2003; Hafner, 2008; Hoffman & Spatariu, 2008;

Liew, McTigue, Barrois & Hughes, 2008), science (Liu, Hsieh & Cho, 2006) in reading (Liew et al, 2008; Nevill, 2008;), language (Magogwe & Oliver, 2007; Mahyuddin, Elias, Cheong, Muhamad, Noordin & Abdullah, 2006) and with general achievement (Caprara, Barbaranelli, Pastorelli & Cervone, 2004; Caprara, Fida, Vecchione, Bove, Vecchio, Barbaranelli & Bandura, 2008; Carroll, Houghton, Wood, Unsworth, Hattie, Gordon, & Bower, 2009; Ferla, Valcke & Cai, 2009; Hoffman & Schraw, 2008; Kumar & Lal, 2006; Liem, Lau & Nie, 2008; Turner, Chandler & Hefter, 2009; Zimmerman et al., 1992). Therefore, the investigation of the relationship between self-efficacy and geography achievement is needed to understand the role of self-efficacy in geography achievement.

Knowledge related to the relationship among emotional intelligence, self-efficacy and geography achievements should be obtained by employing instruments with adequate psychometric properties. If the instruments are poorly designed, the assessment can be a waste of time and money (Anderson & Morgan, 2008). Therefore, the items of the test or questionnaire have to provide unique information about the students such as knowledge and abilities and support the validity and reliability of measurement (April, Hambleton, & Sireci, 2003).

Review of literature indicated that the scales of emotional intelligence have been a more recent development (Rovnak, 2007). Some of these scales are difficult to apply since they contain too many items and some of them did not have acceptable validity and reliability (Aslan & Erkus, 2008). According to Conte (2005), the content and construct validity evidence for emotional intelligence measures is lacking because of unclear theoretical development for many of the measures which

makes the content across emotional intelligence measures varies widely. Therefore, conducting validity study is needed before applying emotional intelligence scales to different cultures (Aslan & Erkus, 2008).

On the other hand, several scales have been developed to measure the self-efficacy among students in different subjects such as Mathematics Self-Efficacy (Pajares & Graham, 1999), College Biology Self-Efficacy (Baldwin, Ebert-May & Burns, 1999), Students' Self-efficacy for Statistical Literacy (Carmichael & Hay, 2009) and Chemistry Self-Efficacy Scale (Uzuntiryaki & Capa Aydın, 2009). However, there is a lack of scales that can be used to measure students' self-efficacy in geography. Thus, developing a scale to measure geography self-efficacy can fill on the gap in this area.

Providing instruments with good psychometric properties to measure geography achievement, geography self-efficacy and emotional intelligence should be rely on objective measurement model. Classical test theory might not able to provide an objective measure because it has several limitations (Hill, 2005). First, the two statistics that form the cornerstones of most classical test theory, item difficulty and item discrimination, are both sample dependent. That means the validity and reliability of test affected by the sample (Wu & Adams, 2007). For example, if the geography Test has given to lower-average knowledge students, a lot of difficult items will be obtained but if the test has given to higher-average knowledge students, a lot of easy items will be obtained. In terms of discrimination indices, higher values tend to be obtained from heterogeneous examinee samples and lower values are associated with homogeneous samples (Wu & Adams, 2007). Second, in Classical

Test Theory, the performance of the person is dependent on the instrument because there is an interaction between the instrument and the sample. As a consequence of this interaction, no prediction can be made about the performance of any student in a particular item (Hill, 2009).

Recently, researchers in education and psychology have shown an increased interest in the usage of item response theory (IRT) and Rasch measurement model in order to achieve the goal of objectivity in the measurement of human abilities (Hobart & Cano, 2010). IRT explains the association between an individual's response to an item and the underlying latent variable being measured by the instrument (Steinberg & Thissen, 1995). The basic assumption of IRT is that the items are measuring a single continuous latent variable. Item responses are assumed to be independent from one to another, the item difficulty is independent from the persons, and the person ability is independent from the items (Lord, 1980).

Rasch measurement model is one-parameter model that considered important in measuring educational abilities and psychological traits of students because of its ability in constructing the objective scales (Hobart & Cano, 2010). The requirements for a good measurement can be offered by this model (Wright, 1997). The estimation of item difficulty in this model is sample-free and the estimation of person ability is test-free. This model is able to provide linear equal scale, overcome missing data, provide reliability, and it is easy to apply (Wright, 1997).

One of the most important features of the Rasch measurement model is that it enables the estimation of the locations of item difficulty and students ability along an

interval-level scale that uses a unit of measurement called logit (Ko, Lo, Yeo, Yang, Yeo, Chong & Thumboo, 2009). This scale allows providing a clear picture about the performance of students based on their abilities and the items' difficulty (Zubairi & Kassim, 2006). Another property of Rasch measurement model is that the estimation of item difficulty is independent of the particular sample of students who respond to these items and that enables to generalize the item difficulty across different sample (Zubairi & Kassim, 2006). Additionally, Rasch measurement model permits creating the person-item map which can use to find out whether the distribution of items matching the distribution of abilities (Bond & Fox, 2001), to check whether the items efficiently represent the construct that measured and to detect whether a noticeable gaps found in the item difficulty hierarchy (Baghaei, 2008). Moreover, the validity of instrument is assessable in Rasch model by using fit indices to determine whether all items work together to measure a single variable, whether the person was responding in acceptably way, and by examining the item order (Bond & Fox, 2001).

In short, geography achievement can be predicted by self efficacy and emotional intelligence. Using reliable and valid instruments in order to investigate the relationships between these variables is essential to get confident results. Rasch measurement model can provide these reliable and valid instruments because this model is an objective model that has some characteristics which are not available on the others measurement models. Therefore, the current study employs this model to examine the psychometric properties of the instruments that used in the present study before the investigation of the relationships between geography achievement, geography self efficacy and emotional intelligence.

1.4 Problem Statement

In spite of its importance, geography did not receive adequate attention from the researchers in Oman albeit the similarity of the importance to math and science especially in terms of career preparation for grade 12th students. Some researchers in Oman (e.g Algharibi, 2008; Alnofli, 2010) recommended that there is a need for further studies to investigate different aspects of learning social studies and its related subjects such as geography. Thereby, interrelationship between geography achievements and psychological aspects of the students is one important recommended area to study.

Despite their significance, self-efficacy and emotional intelligence as psychological factors of the students are often neglected and rarely studied in the context of Oman. Most of the studies that addressed psychological factors have focused in specific factors such as motivation (Alarimi, 1999; Alshuaili, 2007; Alshiadi, 2005), math anxiety (Alagmi, 2005; Almashani, 2002), self esteem and test anxiety (Alkahali, 2005) and locus of control (Almaawali, 2004). Currently, there is a need for further studies in Oman to investigate the relationship among self-efficacy, emotional intelligence and academic achievements.

Moreover, most studies in self-efficacy have focused on measuring the teachers' self-efficacy (Alagmi, 2007; Albolushi, 2002; Alhinai, 2006) and neglected the students' self-efficacy. Meanwhile, the investigation of emotional intelligence also focused on teacher (Alhabsi, 2008), school principals (Alhindasi, 2008) and adults (Alhinai, 2002) but no study in Oman was conducted to measure the emotional intelligence of secondary school students.

Studies related to self-efficacy and emotional intelligence must be supported by appropriate instruments to measure those two factors; however, such instruments for Omani context have not been developed yet. To date, in Oman, there is only one adapted measure in emotional intelligence which is Mayer, Salovey, and Caruso Emotional Intelligence Test (MSCEIT). However, the validation of this test in Omani context indicated low reliability and validity (Alhinai, 2002). One of the possible solutions to address the lack of emotional intelligence scale is to adapt more suitable scale and validate it using an appropriate measurement tool. USM Emotional Quotient Inventory (USMEQ-i) is one of recently measure developed that has good validity and reliability (Saiful, Rahman & Fuad, 2010; Saiful, 2011). Therefore, validating this scale in the Omani context can be more valuable to measure the emotional intelligence of students in Oman.

Review of literature indicated that scale to measure students' geography self-efficacy is yet to be developed in Oman. So far, the available self-efficacy scales in Oman have been developed in order to measure teachers' self-efficacy (Alagmi, 2007; Albolushi, 2002; Alhinai, 2006) and not students' self-efficacy. Since, the self-efficacy scales must be linked to a specific task and not connected to general situations (Bandura, 2006) thus, a specific scale has to be developed to measure geography self-efficacy among students in Oman.

Moreover, according to the study by Alnabi (2011), the procedures of developing and analyzing the final exams (which geography is one of them) of grade 12^{th} in Oman rely on the classical test theory and that contributes to unreal results about the characteristics of the items' exam and students performance. Thus,

developing reliable and valid test to measure students' achievement in geography should be taken into account when investigating the relationship among emotional intelligence, self-efficacy and geography achievement.

Therefore, developing or validating instruments to measure emotional intelligence, geography self-efficacy and geography achievement should rely on a better measurement model. One of the accessible model that can help to achieve much accuracy and objectively in measuring is the Rasch measurement model (Bond & Fox, 2001). Rasch measurement model is a unidimensional model because it assumes that the items in the test should measure one attribute at a time (Wu & Adams, 2007). The assumption of unidimensionality can be detected through various statistics such as fit statistics and principal component analysis of residuals (Linacre, 2010). Rasch measurement model also enables the developer of the test to check if any irrelevant construct measured by the test using fit statistics (Baghaei, 2008). In addition, this model is able to create a measure of each person's ability on a linear scale and provides a standard error of measurement for each person measured which help to estimate the reliability (Wright & Stone, 1999). Meanwhile, errors such as item bias can be detected by testing differential item functioning across groups (Wu & Adams, 2007). The functioning of categories in the rating scale can be tested to show if these categories are working well (Linacre, 2002). Person-item map that created by Rasch measurement model makes possible to check the construct under-representation in the instruments (Baghaei, 2008) and enables to determine to what extent that items difficulties matching students' abilities (Green & Frantom, 2002).

In brief, the facilitative roles of emotional intelligence and self-efficacy in students' achievement have been recurrently stressed in the relevant literature review. Given the importance of geography in grade 12th in Oman and due to the lack of studies that related to the students' achievement in this subject, the current study tries to fill in the gap by investigating the relationship among geography achievement, geography self-efficacy and emotional intelligence. Moreover, the availability of appropriate instruments with sound psychometric properties to measure those construct can be one of the obstacles in this investigation. Thus, the development of valid and reliable scales to measure geography self-efficacy, emotional intelligence and geography achievement seems to be very demanding especially in Omani context.

1.5 Purpose of the Study

The purpose of this study is twofold. First, is to examine the psychometric properties of the instruments that used in the present study namely Geography Achievement Test, Geography Self-efficacy, and USM Emotional Quotient Inventory by employing the Rasch measurement model. Second, this study aims to examine the relationship between self-efficacy, emotional intelligence, and geography achievement. Specifically, the objectives of this study are as follows:

1. To examine the psychometric properties of the items and instruments by investigating the dimensionality, item fit statistics, differential item functioning, response categories, reliability and construct validity of the Geography Achievement Test, Geography Self-efficacy Scale and USM Emotional Quotient Inventory.
2. To investigate the relationship between geography self-efficacy, emotional intelligence and geography achievement among students' 12th grade in Oman.

1.6 Research Questions

This study advances the research questions as follows:

1. Do the Geography Self-efficacy Scale, USM Emotional Quotient Inventory and Geography Achievement Test and their sub dimension indicate unidimensionality?

2. Do the items of Geography Self-efficacy Scale, USM Emotional Quotient Inventory and Geography Achievement Test fit the Rasch model expectation?

3. Do the items of Geography Self-efficacy Scale, USM Emotional Quotient Inventory and Geography Achievement Test exhibit gender DIF?

4. Do the five response options of Geography Self-efficacy Scale and USM Emotional Quotient Inventory functioning well?

5. Are the Geography Self-efficacy Scale, USM Emotional Quotient Inventory and Geography Achievement Test reliable?

6. Do the Geography Self-efficacy Scale, USM Emotional Quotient Inventory and Geography Achievement Test indicate construct validity?

7. Are there any statistically significant direct and indirect relationships between geography self-efficacy, emotional intelligence and geography achievement?

1.7 Rationale of the Study

This study is conducted as a response to some rationales and needs: First, the great attention that has done by the Ministry of Education in Oman in order to develop the secondary education. This attention represented in several national and regional activities related to secondary education such as the International Conference on the reform of secondary education (Ministry of Education, 2002) and the Regional Seminar on the development of post-basic education (Ministry of Education, 2005). Second, the recommendations of some researchers (e.g. Algharibi,

2008; Alnofli, 2010) to studies different factors that related to geography achievement regard to the importance of geography for students in grade 12^{th} as an interesting subject which might play a significant role for their future.

Third, the objectives of post-basic education system have emphasized the non cognitive factors in the development of students' achievement. Example of these objectives are, the ability to identify, describe, analysis, and solve problems; the ability to interact with others in peace, awareness of the rights and duties, and spirit of high responsibility; the ability to express feelings and response appropriately and effectively; the ability to develop good relationships and working as a team to achieve common goals; and the ability to show appreciation and consideration for others (Ministry of Education, 2008c).

Fourth, the facilitative roles of the factors of emotional intelligence, self efficacy in students' quality of life and their achievement have been recurrently stressed in the relevant literature review. Additionally, the lack of Omani studies that tried to combine the variables of the emotional intelligence, self efficacy and students' achievement and model the relationship among them. Finally, this study came as a response to the lack of the appropriate instruments that can be used to measure emotional intelligence and geography self efficacy of the secondary students in Oman.

1.8 Significance of the Study

The results of present study may provide reliable and valid instruments to measure geography achievement, emotional intelligence and geography self-efficacy

that can be used particularly in the context of Oman. Moreover, it might be a guideline for the officers' assessment in the Ministry of Education in using Rasch measurement model to develop the final exams of grade 12th. Additionally, the findings of this study might prove useful in designing a training program that is specifically tailored for assessment officers in order to improve their knowledge and skills in developing the final exams of grade 12th based on Rasch model.

This study may draw more attention of educational stakeholders in Oman to the importance of emotional intelligence and self-efficacy in students' achievement. This investigation can also provide the Ministry of Education in Oman with current data that might support the policy of reformation and improvement of the secondary education in Oman.

Results from this study might help the teachers in Oman to better understand the factors contributing to improve students' achievement which would be useful to enhance the teaching strategies and learning techniques in the schools. The results from present study may support teachers' efforts to diagnose and solve the students' problems that related to the low level of self efficacy and emotional intelligence.

The results of this study could also add to the literature and knowledge in the field of the psychometric particularly Rasch model and structural equation modeling. It could also support the theories of emotional intelligence and social cognitive in their claims about the role of self-efficacy and emotional intelligence in students' achievement. Finally the results of this study could serve as a foundation for the research community who wish to proceed with further research to investigate other

internal factors related to students' achievement or related to development of valid instruments to measure emotional intelligence and self-efficacy among students from different grades and different subjects.

1.9 Limitations of the Study

This study is limited to examining the psychometric properties of three instruments namely: Geography Achievement Test, Geography Self-efficacy Scale and USM Emotional Quotient Inventory using a Rasch measurement model. It investigates the relationship of only three variables that are geography achievement, geography self-efficacy and emotional intelligence. The data in the present study were collected from government secondary schools of two regions in Oman: Albatinah South and Albatinah North, while the private and bilingual schools were not included. This study was conducted only among 12^{th} grade students who were enrolled in geography in school year 2010/2011. The results from present study were limited to this survey population.

1.10 Definitions of Terms

For the purpose of this study, the following terms have been defined:

1.10.1 Psychometric properties

In this present study, psychometric properties is defined as the characteristics of Geography Self-efficacy Scale, USM Emotional Quotient Inventory and Geography Test in terms of unidimensionality, item fit, gender DIF, response category functioning, reliability and construct validity.

1.10.2 Geography Self-Efficacy (GSE)

Bandura (1994, p.5) defined self-efficacy as" people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives". For the purpose of present study geography self-efficacy is defined as the beliefs of students' grade 12th about their capabilities to achieve and succeed in a specific geography tasks that related to the development of cartography, stages of map production, use of computer and internet in mapping, map scales, tools and devices used in mapping, the use of meridians of longitude and parallels of latitude in map and the use of GPS.

1.10.3 Emotional Intelligence (EI)

Salovey and Mayer (1990, p.5) defined emotional intelligence as "subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions", while Bar-On (1997) as cited in Mayer, Salovey and Caruso (2000, p.14) defined it as "an array of non cognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures". For the purpose of the present study, emotional intelligence is defined as the capabilities, competencies, and skills of students' grade 12th that included in USM Emotional Quotient Inventory and classified to seven sub dimensions namely emotional control, emotional maturity, emotional conscientiousness, emotional commitment, emotional fortitude, and emotional expression.

1.10.4 Geography Achievement (GA)

It refers to the level of accomplishment that students' grade 12th have achieved in the subject of geography at the end of first semester in the school year 2010/2011 and it is measured by the geography test. The geography achievement content includes development of geographical thought, approach to cartography, mapping science, field surveying, global positioning system, photogrammetry, cartography, benefits of computer and internet in cartography. This content is distributed into three cognitive domains namely knowledge, comprehension and application and higher level thinking.

1.10.5 Grade 12th

Grade 12th is the last grade of Post Basic Education that covers grade 11th and grade 12th. The age of students in this grade ranged between 17-19 years old. The curriculum in grade 11th and grade 12th is organized on a core and elective subjects and the students have the opportunity to choose programmes that are appropriate for their varying abilities and interests (Ministry of Education, 2008c).

1.11 Conclusion

There is an increase interest in education research to study the relationship between factors of emotional intelligence and self efficacy with students' achievement in different subjects' schools. The present study corresponds to this attention by investigating the relationships between geography achievement, geography self-efficacy and emotional intelligence among students' grade 12^{th} in Oman.

Since the existence of valid and reliable instruments is essential to investigate the relationships between these factors, this study firstly seeks to examine the psychometric properties of the instruments that use in this investigation namely: Geography Achievement Test, Geography Self-efficacy and USM Emotional Quotient Inventory.