

The Validity of the Pedagogical Beliefs of High School Islamic Education Teachers' Survey

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## Abstract

The purpose of this study was to establish validity evidence for the Arabic translation of an existing survey developed by Iluz and Rich (2009) for Jewish education. The Pedagogical Beliefs of High School Islamic Education Teachers' Survey was developed by the author, and administered to Islamic education teachers in Saudi Arabia. That study was published in Almatari (2012). An adequate validity analysis was not conducted; therefore, a further investigation was necessary. 201 male and female Islamic education teachers participated in this study. An Exploratory Factor Analysis (EFA) was used to evaluate the translation-back translation procedure. Maximum Likelihood (ML), Principle Axis Factoring (PAF), Alpha Factoring (AF), and Unweighted Least Square (ULS) were selected as methods of extraction. Promax rotation method was requested. Results were consistent among these four methods of extraction. Four items were removed due to low communalities or the items did not reach the acceptable minimum load to its factor. The whole survey was supported by EFA. Five factors were extracted from the 24 items. The five underlying factors resulted from consulting EFA were theoretically supported as well. Translation back-translation technique was performed well, and led to clear interpretations for EFA results.

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## Chapter One

### Introduction

#### Background of the Study

More than thirty years ago, Fenstermacher (1979) predicted that the study of beliefs would become the focus for teacher effectiveness research. Researchers have described teachers' beliefs as being the most valuable component in the psychological composition of the teacher (Khader, 2012). These beliefs are as lenses through which new experiences and information can be understood and interpreted. When people believe that something is true, they tend to look for information that supports that belief. What teachers do inside their classroom is said to be governed by what they believe. Beliefs often act as a filter that forms instructional judgments and decisions (Pajares, 1992). Beliefs are the best indicators of the decisions that teachers will make throughout their lives. Therefore, exploring teachers' beliefs is an essential feature in understanding what influences their perceptions and judgments, and which, in turn, affect their behavior. Understanding teachers' beliefs is one of the most important factors that play a fundamental role for any educational reform as teacher's beliefs "provide a means by which teachers are able to make sense of the complex realities they face in schools" (Wandén, 2009, p. 89).

Research in teachers' beliefs has been conducted in different subject area; for example, Grossman (1990) explored in his study beliefs regarding English language. Beliefs regarding teaching foreign languages were explored by Freeman (1991). In addition, beliefs regarding teaching mathematics were explored by MacDiarmid (1993). Cornett, Yeotis, and Terwillinger

(1990) in their study, "Teacher personal practical theories and their influence upon curricular and instructional action: A case study of a secondary science teacher" explored beliefs regarding teaching science. For social studies, beliefs were studied by Johnson (1990). However, according to Wanden (2009), there has been little research in teachers' beliefs in the field of religious education.

At the level of Jewish education, Iluz and Rich (2009) in their study "Internal and external factors shaping educational beliefs of high school teacher of 'sacred' subjects to girls," explored the pedagogical beliefs in terms of Jewish education for both teachers of sacred subjects and teachers of secular subjects. Additionally, the study compared teachers' beliefs based upon type of high school. There were three types of high schools: comprehensive, academic, and ulpanas. For Christian education, Wanden (2009) conducted a study to explore teachers' perception of the purpose of classroom religious education in New Zealand Catholic Secondary schools. At the level of Islamic education, generally speaking, the literature regarding Islamic education is insufficiently addressed. The number of publications dealing with Islamic education is limited, even in Saudi Arabia where Islamic education occupies a prominent position (Bedaiwi, 1998, p.45). The purpose of the current study was to establish validity evidence for the Arabic translation of an existing survey developed by Iluz and Rich (2009) for Jewish education.

## Overview of Validity Evidence

Without the ability to make valid inferences from scores on a particular instrument, the research enterprise is compromised. Validity evidence requires gathering of evidence to build a case of validity that enables instrument users to accurately understand the purposes for which the measure is intended and hence make informed judgments about its usage (Coleman, 2006). The Standards for Educational and Psychological Testing (1999) introduced five types of validity evidence. The first type is evidence based on content. It is established when a group of experts in a particular field works together to build an instrument and provides agreement about the appropriateness of the instrument items. This type of evidence is widely used. Most instruments require this type of evidence as a minimum requirement. Second, evidence based on response processes is important when the process of the instrument is part of the assessment. This type could be achieved by asking participants why they have arrived at the conclusion of the study. Third, evidence based on the internal structure focuses on the evaluation of the structure of a test through applying statistical methods. Different statistical techniques may provide information regarding the estimates of internal consistency, item-construct correlation, instrument dimensionality, differential item functioning, factor analysis, and other methods. Fourth, evidence based on relations to other variables or as measurement theorists commonly referred to this type of evidence as convergent and discriminant validity. Convergent validity is when participants' scores on an instrument positively correlates with other participants' scores measuring the same or a similar construct. Discriminant validity, on the other hand, is when participants' scores on an instrument had less association with other participants' scores on a

different construct. The last type is evidence based on the consequences of testing concentrates on the use of inferences resulted from participants' scores on an instrument.

The variety of validity types indicates that validity is a unitary concept, which means that not all measurements require the same type of evidence and that some instruments require more validity evidence than others (Coleman, 2006). Although there is no preference among these types of validity evidence, evidence based on internal structure is the type that is most affected by measurement theorists (Coleman, 2006). The most common techniques for establishing this kind of evidence is factor analysis, which has two types: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Each method has unique aspects and can increase understanding of the instrument's internal structure.

### Rationale and Significance

The Pedagogical Beliefs of High School Islamic Education Teachers' Survey was developed by the author, and administered to Islamic education teachers in Saudi Arabia. That study was published in Almatari (2012). An adequate validity analysis was not conducted. A clear report for an instrument development including implementing the techniques for validity and reliability is a responsibility for the instrument developer. The lack of information about reliability and validity evidence leads to a poor measurement. The cost of using poor measurement can be greater than any benefits that the researchers may attain in their research (DeVellis, 2003). Poor measurement gives wrong information and hence inaccurate decisions are made. Messick (1995) illustrated the importance of validity and reliability:

Because validity, reliability, comparability, and fairness are not just measurement principles, they are social values that have meaning and force outside of measurement whenever evaluative judgments and decisions are made. As a salient social value, validity assumes both a scientific and a political role that can by no means be fulfilled by a simple correlation coefficient between test scores and a purported criterion or by expert judgments that test content is relevant to the proposed test use. Indeed, validity is broadly defined as nothing less than an evaluative summary of both the evidence for and the actual – as well as potential – consequences of score interpretation and use (p.742).

In fact, paying more attention and spending more effort and time investigating the validity and reliability of any scale is more important than even the conclusion one might reach for study. Therefore, this study attempted to review the theoretical framework that the original survey was built on. In addition, the researcher provided information regarding validity and reliability in order to be useful for future research in the field of religious education in general and Islamic education in particular. This study added to the existing literature regarding the scale of Islamic education. It will also encourage other researchers to pay more attention to measuring teachers' beliefs in different subjects at different school levels. Last, this study could be used as a base for a better, more complete understanding of teachers' beliefs from different subjects. This could lead educational research closer to accomplishing reliable and valid results, and hence decisions about teaching could be made with more accuracy.

### Research Questions

The study aimed to answer one main research question, “Is the pedagogical belief of high school Islamic education teachers’ survey valid and reliable?” To answer this question, the

researcher developed four possible sub-questions in order to investigate the validity and the reliability of the survey. These sub-questions are as follows:

1. Were appropriate translation procedures followed?
2. Does a factor analysis suggest that the five domains hypothesized do account for survey responses?
3. Are results of the Arabic translation version consistent with results found with the original English-language version of the survey?
4. Are the survey and its subscales reliable?

## The Definition of the Terms

### Teachers' Beliefs

The selected definition of teachers' beliefs is based upon defining what belief is. Brown and Cooney (1982) reported that beliefs are dispositions to action and major determinants of behavior. Therefore, teachers' beliefs are the pedagogical principles in which their role is to form instructional judgments and decisions.

### Validity Evidence

Validity analysis is a process that requires gathering of evidence in which researchers build a case of validity that enables instrument users to accurately understand the purposes for which the measure is intended and hence make informed judgments about its usage (Coleman, 2006).

### Reliability

Reliability is “the proportion of variance attributable the true score to the latent variable” (DeVellis, 2003, p. 27).

## Chapter Two

### Review of Literature

This review of the literature consisted of two parts. The first part aimed to present the philosophical and theoretical framework for the teachers' beliefs and how they are developed. This review also presented the argument discussed in the literature regarding what constitutes teachers' beliefs and how it contributes to this research. The second part of this chapter briefly discussed the theoretical framework for the validity techniques that were used for the survey in this research.

#### **Part One: The Theoretical Framework of Teachers' Beliefs**

##### The Development of Teachers' Beliefs

Abelson (1979) identified four characteristics of beliefs: existential presumption, alternativity, affective and evaluative loading, and episodic structure. Existential presumptions are the personal truths everyone holds. Those beliefs are unaffected by persuasion. In addition, they may be formed by chance, an intense experience, or succession of events. These kinds of beliefs are immutable and beyond individual control or knowledge. Alternative beliefs, the second characteristics, are those that were created ideally or alternatively that differ from reality. Nespor (1987) explained this feature of belief by giving an example of a teacher who had a traumatic experience as a student and attempted to create a healthy and an ideal environment that he had fantasized about as a child. The third characteristic is that beliefs have stronger affective and evaluative impact than knowledge. Knowing something is completely different from feeling it. This is similar to the distinction between self-concept or self-esteem and the feelings of self-worth. At the educational level, when teachers have a feeling about the importance of the course

content they teach, this will lead them to expand the time they spend on it and employ all the efforts and skills that they have. The last characteristic is episodic structure. Teachers are influenced by guiding images from the past events in which these images filter the information especially for preservice teachers. Calderhead and Robson (1991) reported that preservice teachers always hold images of teaching from their experiences as students that influence their interpretations. These images play powerful roles in determining how they translate and utilize the knowledge they possess and how they determine the practices they will later undertake as teachers.

### The Definition of Teachers' Beliefs

To define beliefs, Pajares (1992) stated that beliefs are studied in diverse fields that results in a variety of meanings. Therefore, researchers have been unable to adopt a specific working definition. Pajares mentioned many attempts in defining beliefs. For example, Abelson (1997) defined beliefs in terms of people manipulating knowledge for a reason or under a necessary circumstance. Brown and Cooney (1982) reported that beliefs are dispositions to action and major determinants of behavior. Sigel (1985) defined beliefs as mental constructions of experience. Dewey (1933) in his book *How We Think* described beliefs as an assertion about some matter of fact. He also added that beliefs "cover all the matters of which we have no sure knowledge and yet which we are sufficiently confident of to act upon and also the matters that we now accept as certainly true, as knowledge, but which nevertheless may be questioned in the future" (p.6). Rokeach (1968) argued that all beliefs consist of three components: cognitive component represents knowledge, affective component represents emotion, and behavioral component represents action.

## Between Knowledge and Belief

Pajares (1992) argued that a beliefs system is unlike knowledge in several aspects. A beliefs system does not require group consensus regarding the validity of a person's beliefs. Further, a beliefs system does not even require an internal consistency within its structure. The lack of group consensus or as Pajares (1992) called it nonconsensuality, "implies that belief systems are by their very nature disputable, more inflexible, and less dynamic than knowledge system" (Pajares, 1992, p. 311). Knowledge systems are built by reason and evidence. In addition, scholars are the developers of knowledge systems contrary to the beliefs' system. When beliefs are subject to change, they are not because of logic and reason, but rather, "conversion or gestalt shift" (Pajares, 1992, p. 311). Another difference is that a knowledge system is open to criticism, evaluation, and critical examination, whereas a beliefs system is not. Nespor (1987) added a third difference. A beliefs system is more powerful as these beliefs may defy logical rules. A knowledge system, on the other hand, takes its power from being compatible with logic and reason.

Pajares (1992) drew from Anderson (1985) two categories of knowledge: declarative and procedural knowledge. Declarative knowledge is the knowledge of what, whereas procedural knowledge is knowing how things work. Paris, Lipson, and Wixson (1983) introduced a third type of knowledge called conditional knowledge. A good example to illustrate these three types of knowledge is when a teacher learns the management of a classroom (declarative knowledge), and knows how the classroom management works (procedural knowledge), and knows when or under what conditions a particular one is appropriate. The beliefs system underlies these knowledge categories.

## Components of Teachers' Beliefs

Pajares (1992) divided the components of teachers' beliefs into three categories: 1) beliefs regarding the subject matter, 2) beliefs regarding student's learning and achievement, and 3) beliefs regarding teacher's roles and responsibilities.

### Beliefs Regarding the Subject Matter

Beliefs regarding the subject matter possess different features, histories, and status that may affect teachers' work inside their classrooms. Grossman and Stodolsky (1995) discussed a variety of concepts regarding teachers' beliefs toward the discipline. Defined to open is one of major features of teachers' beliefs toward the subject matter. For example, Bernstein (1971) distinguishes between subjects that have strong boundaries around their content and hence offer fewer curricular electives from the subjects that are more flexible and offer students more choices. Another feature of teachers' beliefs regarding the discipline is the status of the subject. Ball and Lacy (1984) reported that teachers of math and science, for example, are always seen as having higher status because of their subject and this higher status may enable them to claim greater resources and power within school and the larger community. Teachers of art and music, on the other hand, may not hold this higher status.

Grossman and Stodolsky (1995) added another feature, which is that the subject matter may differ with regard to the subject's relationship with the government or the school district. For instance, math or English are always included in the state's test or program, whereas social studies or art may not be included. Grossman and Stodolsky (1995) also discussed a fourth feature that may form teachers' belief toward the subject matter, which is called sequentiality of

the subject. For example, English studies in high school has a rigid sequential subject: English I, English II, English III, and English IV. Teachers who are teaching English III depend on their colleagues in English I and English II. Social studies, on the other hand, would seem to possess less sequential dependency with regard to the content of curriculum. Subject scope and coherence is a fifth feature that forms teachers' belief toward the discipline. For instance, social studies draw on many disciplines such as history, anthropology, geography, political science, economics, psychology, and sociology. When any subject is drawn from diverse disciplines, this makes it difficult to establish consensus about the content of the subject matter. Ball (1981) added a sixth feature that contributes in shaping teachers' belief toward their subject, called static-dynamic. Ball's study (1981) found that math and foreign language teachers were most resistant to any change in their subjects. This resistance refers to the belief that the nature of their subject is more static than dynamic. Grossman and Stodolsky (1995) concluded their features of beliefs in terms of discipline that the subject matter may differ based upon its relation to the nature of knowledge (hard vs. soft).

### Beliefs Regarding the Learners

The work of Daniels and Perry (2003) emphasizes students as learners and achievers. This component measures teachers' image of students that concentrates on the intellectual abilities and skills, thinking processes, academic motivations and aspirations, and other achievement related attributes. Based on the work of Iluz and Rich (2009), they added two more components regarding teachers' beliefs toward students as learners and achievers. Students' behavior, the first component, refers to teachers' beliefs about the effects on students' moral and social behavior. Student's affect, the second component, reflects the teachers' beliefs about students' emotional

development including the identification with adult role models. Anderson and Holt-Reynolds (1995) added a fourth component regarding teachers' beliefs toward students learning, called student activity. Some teachers would consider academic tasks and class activities as less important for learning process than the oral or written test that presented the content to be learned.

### Beliefs Regarding the Teachers' Role

Beliefs regarding the teachers' roles and responsibilities are derived from the work of Holt-Reynolds (2000) and Fenstermacher and Soltis (1992). These studies explored the purpose of teaching. Fenstermacher and Soltis (1992) identified three roles of teaching: the executive role, the therapist role, and the liberationist role. A teacher in the first approach plays a role of executor who is responsible to accomplish the curriculum objectives using the best skills and techniques possible. The second approach, the therapist approach, or as it is named in the current study "teacher role as mentor," views the teacher as an empathetic person who is responsible to help students to grow personally and reach a high level of self-actualization. Finally, the third approach, the liberationist approach, views the teacher as a liberator of student's mind, a developer of student's knowledge, and an enhancer to student's moral decision. Figure 1 shows the components of teacher's beliefs as presented from the previous literatures.

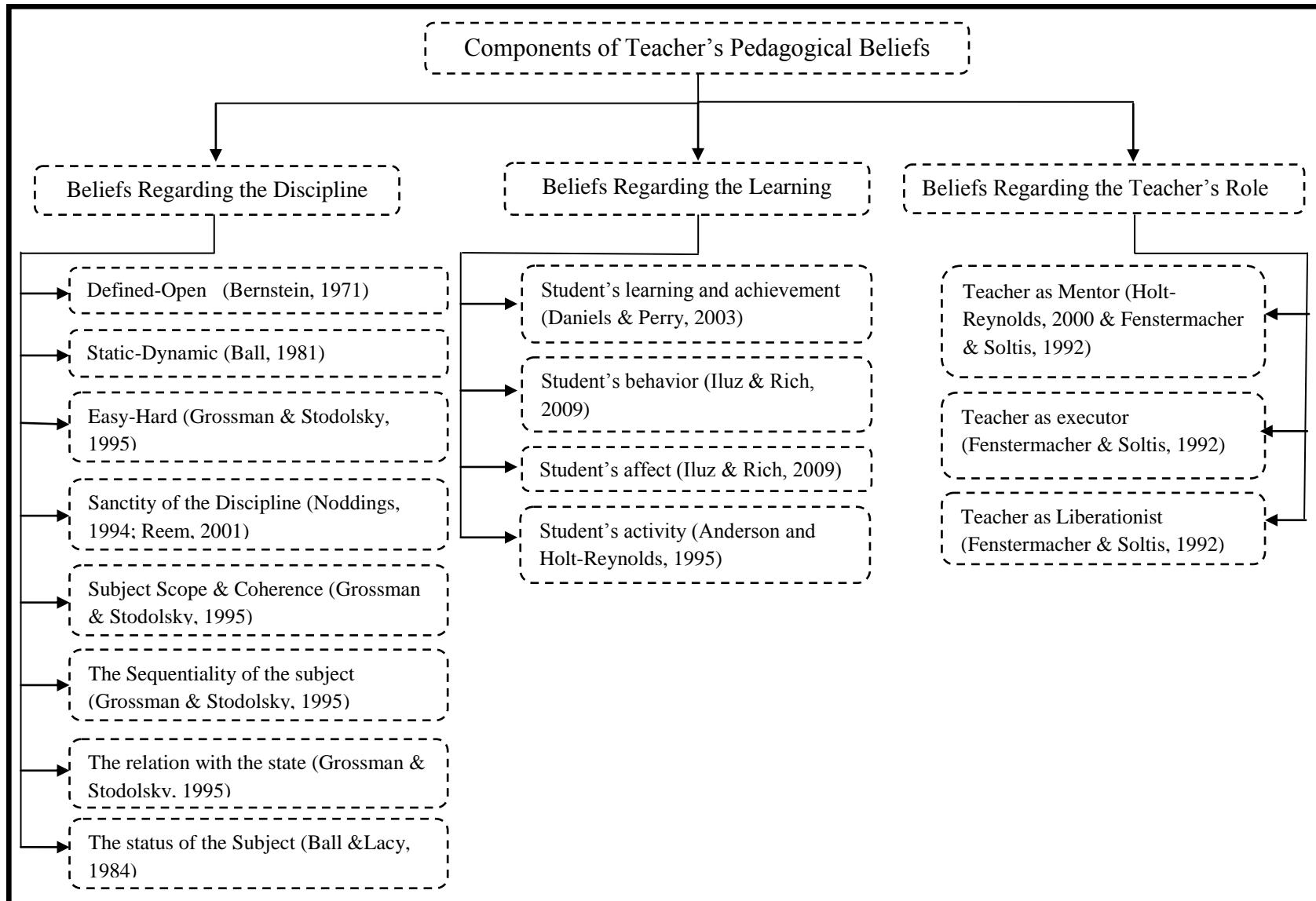


Figure 1: *The Components of Teacher's Beliefs and their Developers as Presented from the Previous Literature.*

## **Part Two: Validity Evidence**

### Theory as a Guidance to Develop the Instrument

When developing a scale, the essential evidence of validity is to build an instrument that is well grounded in the substantive theories related to the phenomenon to be measured. DeVellis (2003) explained the importance of basing the instrument on theories:

Because there is no tangible criterion against which one can compare this type of scale's performance, it is important to have some clear ideas to serve as a guide. The boundaries of the phenomenon must be recognized so that the content of the scale does not inadvertently drift into unintended domains (p.60).

In fact, theory is an aid for a clear instrument. Theories should be always considered before developing a scale. Clarity directs instrument developers to be aware of what to include and exclude in the measure (DeVellis, 2003, p.62). Two major threats to validity can be avoided when the instrument was built on a well-documented theory. First, construct-underrepresentation is when the assessment is too narrow as it fails to include the important dimensions or facets of the measurement. The second threat is called construct-irrelevant. This type of threat can be seen when an instrument is developed in a broad way that contains other dimensions that are not intended to be measured in the assessment (Messick, 1995).

### Validity Methods for Translating the Instrument

An essential part of content validity in the current study is translating the instrument in order to be appropriately administered to a different population. The need to establish validity for translating the instrument refers to the fact that "validity is context specific and is not an abstract notion that transfers from one instrument to another" (Griffey, 2001, p.3). Translating the instrument from a particular language to another language does not necessarily result in an equivalent instrument. Having a highly validated original instrument does not mean that the translated one must also be validated.

Many problems may stem from translating the instrument from one language to another. Rode (2005) reported that questions in a questionnaire or wording of items in an instrument are culturally anchored. The questions may be appropriate for some contexts and less appropriate in other contexts. In fact, this concern might increase with the use of different languages since many cultural differences are reflected in the differences of languages. When the instrument is translated from one language to another, the connotations may be lost. Some words have special historic connotations in some countries but not in others. Losing the connotations may lead to losing the meaning even if the two instruments were built on the same format and semantics (Rode, 2005). Miller (1992) discussed four possible problems that any translator may encounter throughout the process of translation. The first possible problem is that the syntax of one language may have no equivalent in another language. The second possible problem is that a word in one language may not have the exact meaning in another language. The third possible problem is that a word in one language may have many meanings and all these meanings are not

included in another language. The fourth possible problem is that a word that was figuratively used in one language may not be figuratively used in another language.

Sumathipala and Murray (2000) suggested five essential considerations in translating instruments:

1. Content validity assesses the content of the instrument that is relevant to each culture under investigation.
2. Semantic validity examines if words used in the original instrument have a similar meaning for the translated one.
3. Technical validity is to assess that similar effect should be achieved by the measuring technique in different cultures.
4. Criterion validity explains whether responses to similar items relate to the same normative concept in two cultures.
5. Conceptual validity requires that the instrument relates to a theoretical construct within the culture (p.88).

Griffee (2001) recommended seven questions that should be asked before translating any instrument. First, "Does the researcher state the purpose of the questionnaire?" The purpose of the test is important because researchers cannot evaluate a test if they do not know why the test was used. The second question is "Is the construct defined?" Before developing any instrument, a researcher should first build the test on a well documented theory. If a researcher cannot find a theory, then the researcher may rely on a group of experts in order to define the construct. Third, "Are the items constructed in conformance with the construct?" This question means if, for example, a particular instrument has qualities A,B, and C, then researchers should look for items

that measure A, B, and C and not D. The fourth question is "Was the questionnaire piloted, and were the results analyzed and reported?" It is important to know the reliability evidence, factor analysis, and different methods of validity techniques used for the original instrument. For instance, were any items eliminated or revised as result of implementing these techniques? The fifth question is "Were descriptive statistics provided for the questionnaire results?" In addition to reliability and validity results as stated in question four, knowing the descriptive statistics for the instrument as a whole and for each item is helpful because readers can see the overall results as well as how each item performed. The sixth question asks, "Is the questionnaire population defined?" This is a necessary step because it goes to generalizability. More important, this step may enable the readers to interpret the results and apply those results to their own situation. The last question, "Is the actual questionnaire provided?", is an important question because it allows researchers to replicate and re-analyze the instrument which, in turn, increases the validation of the instrument.

Several techniques were presented from the literature to ensure validity for translation. For example, Rode (2005) mentioned four methods for converting the instrument from one language to another. One of the most well known is called translation backtranslation procedure. The original instrument is translated into the target language and then translated back to the original language by an independent translator. Following that, a comparison is made between the original and backtranslated instrument. Another method is called committee approach. This method is part of the first method. However, most of the work in the backtranslation method should be done in a group. In this method, different team members assume three roles: translators, translation reviewers, and translation adjudicators. The third method is called

decentring. It does not require that the translated instrument is close in form or content to the original one. Rather, it requires that the conceptual domain of the instrument determine how the final look of the instrument would be. The last method is called the bilingual approach. It involves a process of translation by one set of bilingual workers who then have the instrument back translated into the original language by another set of bilingual workers. Both bilingual workers who translated the original instrument and those who translated the instrument back into the original language work together in a step called negotiating differences.

### Validity Evidence Based on Internal Structure

When looking for methods by which an internal structure could be established, the more frequently discussed method is dimensionality as identified through Factor Analysis (FA). The concept of dimensionality must be considered first in light of the theory behind the structure of the instrument. The theoretical foundation is of great importance. Researchers should not solely rely on statistical methods to determine the structure of the instrument. A theory should direct the process of development any instrument. Coleman (2006) ruled out one case that only depended on statistical methods in determining the structure of the construct. He stated that sometimes a state of knowledge about the construct is so nascent; that therefore, the researchers should look to statistical methods, such as FA, in order to provide guidance in the theory building process.

FA has a relatively long history. Its beginnings may be traced back to the turn of the 20<sup>th</sup> century when the English psychologist Charles Spearman proposed FA as a technique for investigating his bifactor theory of human intelligence. Over the past century, FA has become a highly popular statistical method in the behavioral and social science (Raykov & Marcoulides, 2011). The primary purpose of FA is to help researchers determine how many latent variables

underlie a set of items. A set of items does not necessarily mean that they are a scale. Items may have no common underlying variable or they may have several variables. Determining the number of latent variables underlying a group of items is critical. The premise of factor analysis is to uncover the underlying construct of the data. In short, "Factor analysis is intimately involved with questions of validity...Factor analysis is at the heart of the measurement of psychological construct" (Roberts, 1999, p.4).

When conducting FA, two possible techniques of analysis may be consulted: Exploratory Factor Analysis (EFA) and Confirmatory Factor analysis (CFA). EFA analyzes the data with a lack of preconceived ideas regarding the underlying constructs or the structure of the data. It is effective when the researcher knows little information about the theory behind the data that has been collected. CFA, on the other hand, is used to test the nature of factors as driven from the theory. Gorsuch (1983) illustrated the main difference between the two modes of factor analysis. He said that EFA finds these factors that best reproduce the variables under the maximum likelihood condition, whereas CFA examines specific hypothesis in terms of the nature of the factors. Roberts (1999) concluded the difference between the two modes is that CFA is a theory testing procedure while EFA is a theory generating procedure.

### EFA

EFA, or as called common factor analysis, is used for data reduction purposes and should be applied when there is a lack of data, theoretical or psychometric, so that researchers can consider CFA. Researchers benefit from EFA because it measures the dimensionality of the scale, the collinearity among dimensions, and the relationships among items and between items and the overall scale (Coleman, 2006). Conducting EFA calls for a series of methodological

steps wherein each one requires informed decision making by a researcher. Wetzel (2011) summarizes from the literature the elements that should be thoughtfully planned, reported, and justified. These elements are (a) model of analysis, (b) sample size criteria, (c) methods of extraction, (d) methods of rotation, and (e) criteria for factor retention.

FA and Principal Component Analysis (PCA) are the most used models, and they are often used interchangeably. The main difference between these two models is mathematically based. FA explains the common or the shared variance, whereas PCA explains the total variance. For PCA, the ultimate goal is for data reduction and all variance (common, unique, and error) are considered in the correlation and covariance matrix. EFA, on the other hand, seeks to estimate an error-free factor solution, and hence EFA is solely limited to the shared variance between observed variables. Research indicated that the findings resulted from conducting both modes were minimal and had little practical impact on the interpretation of the results (Wetzel, 2011).

Sample size criterion is an important element when conducting EFA. Researchers could not reach consensus on the ideal sample size in the research of EFA. Generally, Wetzel (2011) stated that the larger the sample size, the more precise estimates of the population in order to produce stable results across different sample. However, the main question is "How large is large enough?" DeVellis (2003) linked the sample size and the number of items in the instrument: "The larger the number of items to be factored, and the larger the number of factors to be anticipated, the more subjects to be included in the analysis" (p. 137). Tinsley and Tinsley (1987) recommended that the ratio between the numbers of subjects with the number of items would be 5 to 10 subjects per item up to the 300 subjects. DeVellis (2003) classified a sample of 100 subjects as poor, 200 as fair, 300 as good, 500 as very good, and 1000 as excellent. Comrey

(1988) stated that 200 participants are sufficient for most cases of ordinary factor analysis with no more than 40 items in the instrument. The literature indicates many studies that have used factor analysis with a modest sample size, for example 150 subjects.

Several methods of extraction exist. However, within EFA, maximum likelihood, principal axis factoring, alpha factoring, and unweighted least squares seem to be most used in the research of EFA. Maximum likelihood (ML) is one method employed to determine the number of factors to extract. ML applies a  $\chi^2$  goodness of fit test in order to test the null hypothesis that there is no difference between the observed and the predicted correlation matrix or the covariance matrix. This method assumes multivariate normality, so the researcher should test this assumption prior to the analysis. ML is very sensitive to sample size. As the sample size increases, the researchers should be careful about overestimating the number of factors to be retained. In addition to these methods of extraction, Principal Axis factoring (PAF) is used when the data is not normally distributed. Moreover, Alpha Factoring (AF) aims to discover which common factors are “found consistently when repeated samples of variables are taken from a population of variables” (Tabachnick and Fidell, 2007, p.637) Further, Unweighted Least Squares (ULS) minimizes the squared differences between the observed and reproduced correlation matrices. The criterion that determines which of these three methods of extraction to utilize is the level of measurement of the observed variables. Many researchers suggested employing EFA with ML for the instrument with all continuous variables (Wetzel, 2011).

Two major methods of rotation from which the researcher employs what is appropriate for the research are orthogonal and oblique. The primary difference between these two is that orthogonal rotation does not allow the factors to be correlated, whereas the oblique rotation

allows correlation among factors. The purpose of using these two methods of rotation is to enhance interpretability of the factor structure. Interpretability may be maximized each variable by having one high loading with one factor and low or zero loadings for other factors. For orthogonal rotation, varimax is currently the most popular rotation procedure. It also is the default method for most statistical software programs, such as SPSS. For oblique rotation, on the other hand, direct oblimin and promax are the most used rotation methods (Wetzel, 2011).

DeVellis (2003) discussed the criterion that should be consulted when selecting the methods of rotation. He stated that existing theory should direct researchers to choose the appropriate one between these two methods of rotation whether factors are theoretically correlated or not and to what extent they are correlated. Other methodologists suggested employing oblique rotation because it conceptually fits better for most constructs in social and behavioral sciences (Wetzel, 2011; Raykov & Marcoulides, 2011). In all cases, using oblique rotation may add more information about the relationship between factors, which, in turn, enhances the interpretability of research results.

A factor loading matrix should be presented, reported, and interpreted when using orthogonal rotation. Loading matrix represents the relationship between each variable with each factor. For oblique rotation, the analysis is more complex because of the correlation between factors. In this case, pattern matrix is used for interpretation. It represents the unique relationships between factors and observed variables. Both factor correlation and pattern matrix should be reported and interpreted (Wetzel, 2011).

Once the factors have been extracted, the next step is to determine the number of factors to be retained in the factor solution. In fact, the primary purpose of conducting FA is to move

from a large set of items to a small set of factors. To that end, DeVellis (2003) stated that two widely used non-statistical guidelines in order for the researchers to determine the number of factors to extract is the eigenvalue rule (Kaiser, 1960) and the scree test (Cattell, 1966). For the eigenvalue rule, factors that have an eigenvalue greater than one indicate that the factor explains more variance than a single item. Eigenvalue criterion is very popular and currently the default option in most statistical software packages. The accuracy about this method is debatable among methodologists. For example, Wetzel (2011) states that this method often leads to extracting too many factors. DeVellis (2003) discussed the rationale behind this technique. However, using an absolute value (eigenvalue >1) is problematic. What if there is a factor that is slightly greater than 1? Or as DeVellis (2003) asked, "Does the factor that explains 1% more information than the typical item really offers the sort of condensation of information we are after?" (p. 114).

Another option is the scree test, which also depends on the eigenvalue. However, it uses a relative value rather than an absolute value. It is also based upon a plot of the eigenvalues associated with successive factors. Wetzel (2011) described that the scree test is the eigenvalues of each factor in descending order on a chart where the factors are placed on the x-axis and the eigenvalues on the y-axis. The factor on the vertical slope is retained as a valuable factor whereas the factors that are placed on the horizontal are considered the scree or as others called it the rubble at the bottom of the mountain (Wetzel, 2011).

### Internal Consistency

Several methods allow examination of the internal consistency. However, internal consistency is connected with Cronbach's (1951) coefficient alpha,  $\alpha$ . Internal consistency, as the name implies, examines the homogeneity among items within a scale. According to Classical

Test Theory (CTT), a scale should measure a single phenomenon. It suggests that the correlations among items are logically connected to the relationships of items to the latent variable (DeVellis, 2003).

Cronbach's coefficient alpha is widely used as a measure of reliability. Any threat to a scale may reduce the coefficient alpha. Problems in building an individual item or problems in translating the scale from language to language (as aforementioned), poor variability, negative correlations among items, low item-scale correlations, and weak inter-item correlations all will reduce coefficient alpha. Therefore, translating the scale carefully, removing bad items, and weeding out bad items as a result of consulting FA with its two types EFA and CFA will be the best way to have a high coefficient alpha.

Several options may be used in computing Cronbach's coefficient alpha. Some software have item analysis programs that compute alpha. In this study, SPSS will be used. The reliability procedure computes alpha for all items in the scale and for all k-1 versions. SPSS is one of the most useful computer packages. It provides corrected and uncorrected item-scale correlations. Additionally, the program provides coefficient alpha when dropping any item in the scale. Theoretically, alpha can take on values from 0.0 to 1.0. However, practically, it is unlikely to attain either of these two extreme values. DeVellis (2003) stated that methodologists and investigators could not reach consensus in determining the acceptable alpha. All the attempts in determining acceptable alpha were personal opinions and no one can defend an opinion on strictly rational grounds. For instance, Nunnally (1978) suggests a value of .70 as a minimum acceptable bound for alpha. DeVellis (2003) ranged for research scales as follows: below .60,

unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80 respectable; and between .80 and .90, very good.

## Chapter Three

### Methodology

The purpose of this study was to establish reliability and validity evidence for the survey of Pedagogical Beliefs for Islamic Education Teachers. This chapter consisted of participants of the study, the development of the survey, data screening, and data analysis.

#### Research Questions

This study aimed to answer one main research question, “Is the pedagogical belief of high school Islamic education teachers’ survey valid and reliable?” Four possible sub-questions were developed in order to investigate the validity and the reliability of the survey. These sub-questions are as follows:

1. Were appropriate translation procedures followed?
2. Does a factor analysis suggest that the five domains hypothesized do account for survey responses?
3. Are results of the Arabic translation version consistent with results found with the original English-language version of the survey?
4. Are the survey and its subscales reliable?

#### Ethical Compliance

The instrument of the study, The Pedagogical Beliefs Scale of High Islamic Education Teachers, was approved by the Human Subjects Committee in Lawrence HSCL (See Appendix A).

## Sampling and Participants

Participants were high school Islamic education teachers (male/female) from four different school district locations (Urban, Rural, Industrial, and Holy areas). All male/female teachers were Saudi. Teaching experiences ranged from 1 year of experience to 29 years of experience. Principals and teachers' supervisors were contacted and asked to volunteer their school's participation in the current study. A total of 230 copies of the survey were distributed. Two hundred and one surveys were received (87.39%). Table 1 shows the characteristics of the sample of the study.

*Table 1  
Sample Characteristics*

<b>Variable</b>	<b>N</b>	<b>%</b>
<b>Teacher Gender</b>	201	
Male	111	55.2
Female	90	44.8
<b>Teacher Academic Qualification</b>	201	
Graduate Degree	59	29.4
Undergraduate Degree	142	70.6
<b>Teaching Experience</b>	201	
(1-5)	81	40.3
(6-10)	41	20.4
(11-15)	39	19.4

(16- above)	40	19.9
<b>Location of School Districts</b>	201	
Urban Area	64	31.8
Rural Area	43	21.4
Holy Area	38	18.9
Industrial Area	56	27.9

### Development of the Survey

The Pedagogical Beliefs Scale for Islamic Education Teachers (see Appendix B) has 28 items and is designed to measure five constructs. The survey was divided into three categories of teachers' beliefs: (1) beliefs regarding discipline, (2) beliefs regarding student learning and achievement, and (3) beliefs regarding teachers' role inside their classroom.

Grossman and Stodolsky (1995) discussed in their article, "Content as Context: the Role of School Subjects in Secondary School Teaching," a variety of topics regarding teachers' beliefs toward the discipline. In the current survey, we selected two domains. First, the Static-Dynamic domain is related to teachers' beliefs about the extent of change over time in the knowledge presented in the curriculum of religious education. Second, the Easy-Hard domain reflects to what extent teachers of Islamic education perceive their subjects as difficult or easy. What does it mean when teachers believe that they teach difficult subjects? This belief pressures them to demand more of themselves and of their students and to display greater professional commitment. Iluz and Rich (2009) stated that the prestige of the subject is highly and positively

correlated to its perceived difficulty. In addition to these two domains, according to the work of Noddings (1994) and Re'em (2001), a third domain was added in terms of teachers' beliefs toward the discipline called "sanctity of the discipline." This domain refers to what extent teachers of Islamic education treat their subjects as inviolate and unassailable.

Teachers' belief toward students learning and achievement, the fourth subscale in the current survey, is derived from the work of Daniels and Perry (2003). This domain measures teacher perceptions of students as learners and achievers. In other words, do Islamic education teachers see academic achievement and attainments as critically important for students' future happiness and success or not?

For the last domain in the survey, teacher role as mentor is derived from the work of Fenstermacher and Soltis (1992) and the work of Holt-Reynolds (2000). These studies explored the purpose of teaching. Some teachers feel that the main purpose of their teaching is to facilitate students' knowledge acquisition. Other teachers do not belittle the influence of the school and its teachers on students as developing persons. However, they believe that their primary purpose of teaching is to teach and students' primary purpose is to learn. The third type of teachers sees themselves as shapers of students' personality. Those teachers put more emphasis on guiding students in the process of maturation to adulthood.

## The Process of Re-Building the Instrument

To convert the original survey which was built for Jewish education teachers, a group of steps were employed so that the new version of the survey can be administered for Islamic education teachers. Figure 2 shows the possible steps that were employed for redeveloping the survey.

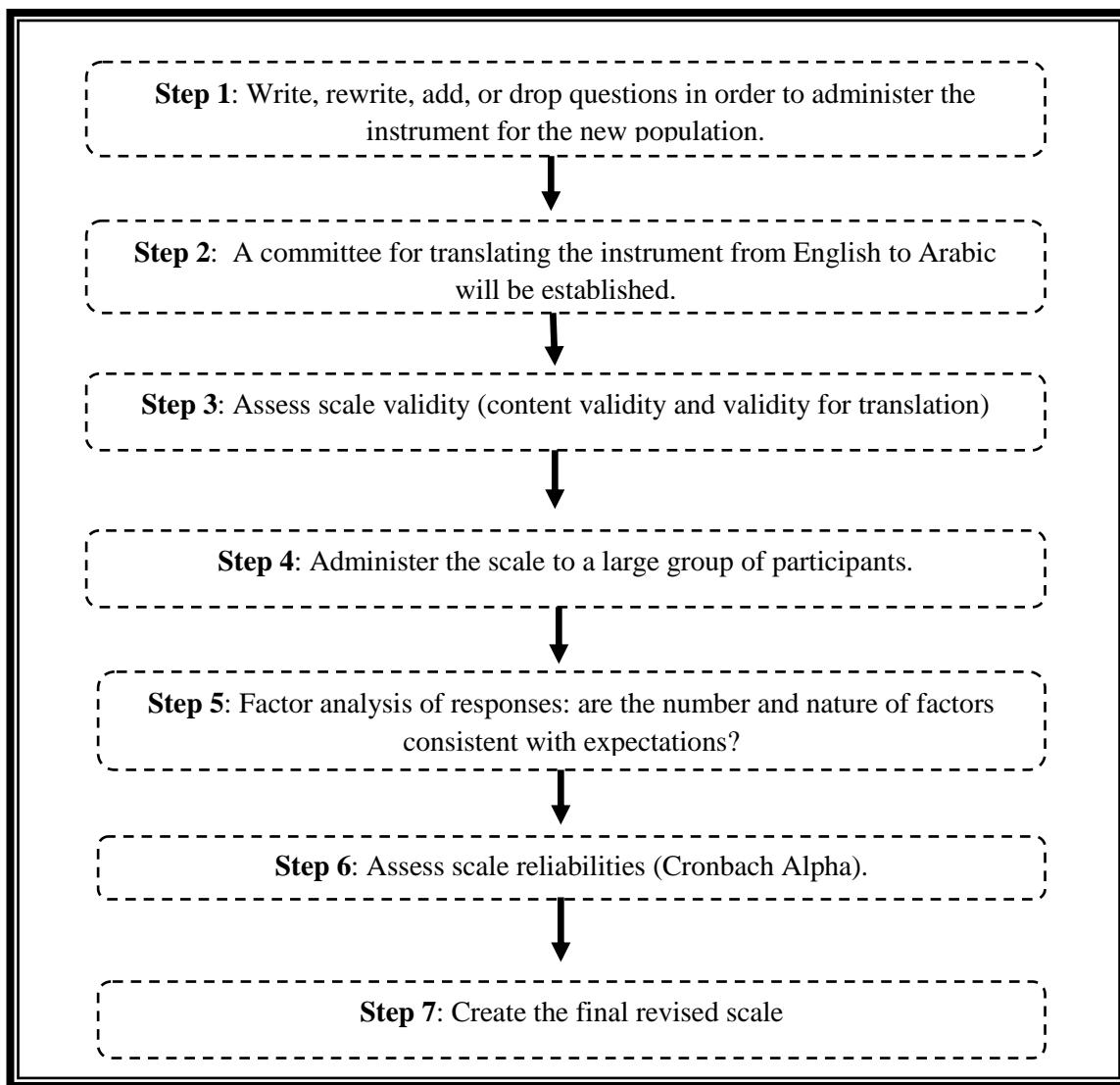


Figure2:

*The Development Process for Rebuilding an Existing Scale for Islamic Education Teachers*

## Data Screening

Prior to the analysis, missing values were evaluated. Before performing any statistical solution about missing values in the data, the researcher tested the hypothesis as to whether they are missing in a random way or not by computing the Little's MCAR test (Missing Completely At Random). Expectation-Maximization Algorithm was used for imputing the missing values. The imputation for missing values was conducted for each subscale. The reason for imputing the missing values for each subscale referred to the degree of correlations between each item with its subscale.

Additionally, the data was examined for univariate outliers using SPSS. The formula used in calculating the outliers was:

$$(\text{Upper 75 quartile} - \text{Lower 25quartile}) * 2.2$$

2.2 is the most used multiplier as suggested by Hoagline, Laglewicz, and Tukey (1986). Moreover, the data was evaluated for multivariate outliers as well. The Mahalanobis Distances was computed to determine the multivariate outliers among the variables. To identify an outlier that exceeds the critical value, a chi-square is used which depends upon two factors: the degree of freedom and the probability level. The degree of freedom is based on the number of variables under investigation, and the probability level set for this test will be .001. Any Mahalanobis Distances score above the critical value was considered a potential multivariate outlier.

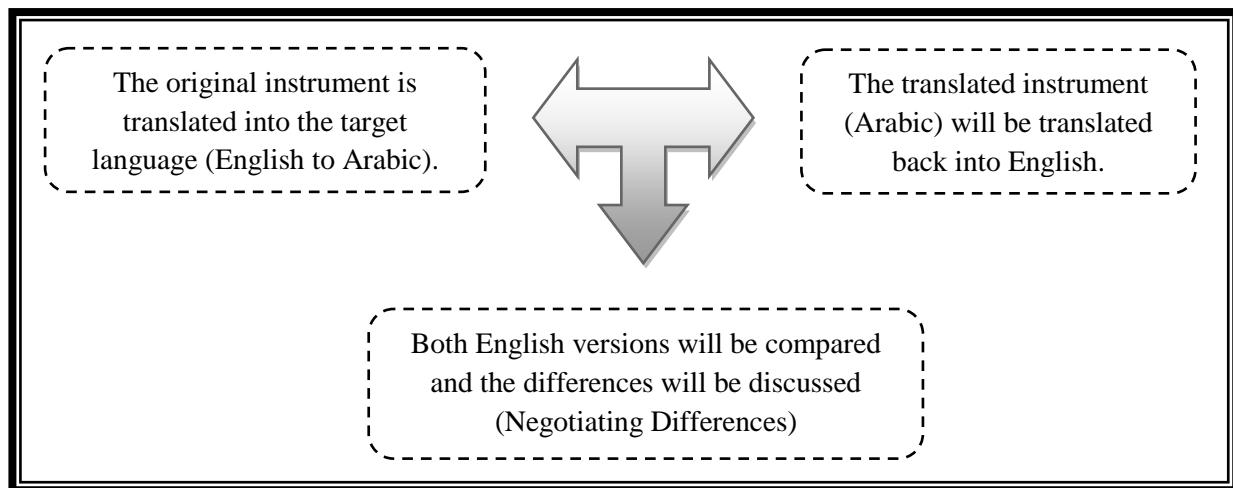
Normality and variability in the data were examined with descriptive statistics. Means, standard deviation, skewness and kurtosis were evaluated in order to detect any potential violations that may affect the results of the study.

## Data Analysis

The study addressed one main research question, “Is the pedagogical belief of high school Islamic education teachers’ survey valid and reliable?” This question was answered by investigating the four sub-research questions.

### 1. Were appropriate translation procedures followed?

A committee for translating the original survey was established. An essential part of content validity in the current study was to translate the survey from English to Arabic language so that it could be appropriately administered to the new population. Rode (2005) mentioned four methods for converting any scale from one language to another. In the current study, the researcher employed one of the most well-known techniques called translation back translation procedure. Translators were experts in both languages (Arabic and English). The back-translation of the target language (Arabic) was conducted by an expert with a very strong background in linguistic. Figure 3 shows the possible steps in employing this technique.



*Figure 3: Steps for Translation Back-Translation Procedure*

2. Does a factor analysis suggest that the five domains hypothesized do account for survey responses?

Exploratory factor analysis (EFA), or as it is also named common factor analysis, was used. The researcher employed it in order to investigate the internal structure of the current instrument. Maximum Likelihood estimation (ML), Principle Axis Factoring (PAF), Alpha Factoring (AF), and Unweighted Least Squares (ULS) were examined as extraction methods. Although research shows that these methods of extraction may lead to different results, Gorsuch (1983) stated that when any scale has 30 items or more or the communalities exceed .60 for most variables, then each method of extraction will nearly produce the same results. For determining the number of factors to retain, eigenvalues ( $>1$ ) and scree plot were considered. Communalities explain the amount of variance that a single item shares with all other items in the scale. When subtracting it from 1, it will provide us with the unique variance. High communalities indicate more shared variance among items than low communalities.

Factor loadings were examined using .30 as a cut off point for evaluation. When the item loadings are at  $\pm .30$  or above, they will be considered as contributing to the factor. For evaluating item homogeneity, interitem correlations were considered. Low interitem correlations lead to lower reliability. It also indicates that items are not functioning well together. For factor rotation, the most commonly used is varimax rotation or oblique rotation. Varimax rotation assumes orthogonally correlated factors, whereas oblique rotation assumes some degree of correlation among factors. Promax is the most used method for oblique rotation.

Choosing EFA over CFA referred to several reasons. First, with a modest sample size ( $N=201$ ), Exploratory Factor Analysis (EFA) is a technique most appropriate specifically in the early development of the revised instrument. Confirmatory Factor Analysis (CFA) often comes as a follow-up to EFA. However, this research only employed the EFA due to the small sample size. Second, Raykov and Marcoulides (2011) suggest not using the same data sample used when conducting EFA to be used in CFA. A large sample size is required for conducting both analyses. Third, many of changes have been made to the original survey in order to be culturally appropriate for the new population; therefore, consulting only EFA is completely reasonable.

3. Are results of the Arabic translation version consistent with results found with the original English-language version of the survey?

To answer this question, means and standard deviations were computed. In the current study, beliefs held by Islamic education teachers were compared with the beliefs of Jewish education teachers derived from the original survey.

4. Are the survey and its subscales reliable?

After considering the findings resulted from conducting EFA, Cronbach's alphas were computed using SPSS software, then compared with the Cronbach's alphas computed for the original survey.

## Chapter Four

### Results

The purpose of the study was to establish reliability and validity evidence for the translated version of the Pedagogical Beliefs of High School Islamic Education Teachers' survey based on conducting factor analytic procedures. This chapter addressed one main research question, "Is the Pedagogical Belief of High School Islamic Education Teachers' Survey valid and reliable?" To answer this question, the researcher developed four possible sub-questions in order to investigate the validity and the reliability of the survey. These sub-questions are as follows:

1. Were appropriate translation procedures followed?
2. Does a factor analysis suggest that the five domains hypothesized do account for survey responses?
3. Are results of the Arabic translation version consistent with results found with the original English-language version of the survey?
4. Are the survey and its subscales reliable?

#### Data Screening

Missing data is one of the most critical issues that the researcher needs to carefully address prior to analyzing any data. Tabachnick and Fidell (2007) stated that "The pattern of missing data is more important than the amount of missing." The pattern of missing lies in determining how much is missing and why it is missing. Missing data are characterized as

missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR). In the data of the current study, missing values was not a problem. The highest amount of missing data was in item 6, “High school students must learn the core body of knowledge which does not change much over time.” Five missing values (2.5%) were detected. Because missing data points were less than 5%, the problems were less serious, and almost any procedure will yield similar results. It is also important to note that the results were consistent with and without the missing values.

SPSS MVA (Missing Values Analysis) was used to highlight the pattern of missing values as well as to replace them in the data set. Expectation-Maximization was used for imputing the missing values. The imputation for missing values was conducted for each subscale. The reason for this refers to the degrees of correlation between each item with its subscale. The pattern of missing data was missing completely at random MCAR. The Little's MCAR was computed for the 28 items of the survey, Chi-Square  $X^2(391) = 418.44$ ,  $p = .16$ . This non- statistically significant result indicated that the probability that the pattern of missing diverges from randomness is greater than .05, so that MCAR may be inferred.

Outliers have two forms: univariate and multivariate, and both were evaluated. For univariate outliers, the formula to calculate the outliers was as follows:

$$(\text{Upper } 75 \text{ quartile} - \text{Lower } 25 \text{ quartile}) * 2.2$$

2.2 is the most used as suggested by Hoagline, Laglewicz, and Tukey (1986). The Mahalanobis Distances were computed to determine the multivariate outliers among the variables. The critical value is 20.52. As a result, any Mahalanobis Distances score above 20.52 was determined a multivariate outlier. The cases that were univariately outlying were multivariately outlying as

well. After deleting these 3 extreme univariate and multivariate outliers, 198 cases were deemed valid to be used in the final analysis.

### Individual Item Assessment

The Pedagogical Beliefs for High School Islamic Education Teachers' Survey (see Appendix B) has 28 items. It is designed to measure five constructs: Static-Dynamic, Easy-Hard, Sanctity of the Discipline, Student Learning and Achievement, and Teacher Role as Mentor. All items in the five constructs are scored on the five Point Likert-scales of agreement (1= Strongly Disagree SD, 2= Disagree D, 3= Neutral, 4 = Agree A, 5 = Strongly Agree SA). Descriptive statistics were computed on each item in the survey in order to assess the normality of scores on the survey. Table 2 reports the mean (M), Standard Deviation (SD), skewness, and kurtosis statistics for each item. From the table, three of the five constructs (Static-Dynamic subscale, Easy-Hard subscale, and Student Learning and Achievement subscale) were normally distributed. However, Sanctity of the Discipline subscale and Teacher Role as Mentor subscale were negatively skewed. Each item in these two subscales was moderately to highly skewed.

Table 2

#### *Item Descriptive Statistics*

N	Pedagogical Beliefs for High School Islamic Education Teachers' Survey	M	SD	Skewness (SE=.17)	Kurtosis (SE=.34)
<b>I. Static – Dynamic Subscale</b>					
1	There are constant changes in the subject I teach.	3.01	1.24	-.11	-1.32
2	The body of knowledge comprising my subject is constant changing.	2.75	1.22	.33	-1.12

4	In my subject you can still teach today what they taught 30 years ago.	30	2.41	1.22	.66	-.75
5	The knowledge in my subject is constantly developing.		2.91	1.22	.14	-1.25
<b>II. Easy -Hard Subscale</b>						
7	Compared to other subjects the subject I teach is hard for students.		1.97	1.03	1.32	1.33
8	I want my students to think that the subject I teach requires a major effort from them.		3.24	1.25	-.17	-1.32
9	The subject I teach demands a high level of analytical skill.		3.17	1.17	-.20	-1.21
11	Students must work hard in my class to understand the material.		3.84	.99	-1.07	.53
12	I make significant academic demands from the students who study my subject.		2.49	1.10	.68	-.57
<b>III. Sanctity of the Discipline Subscale</b>						
13	It's important to me that students relate to the subject I teach with a great deal of respect.		4.61	.78	-2.78	8.74
14	When in class I want students to feel that the value of the subject I teach is different from other subjects.		4.55	.83	-2.43	6.39
15	I will not tolerate arguments in class against our Islamic teachings in the subject.		4.01	1.24	-1.18	.18
16	It is very important to me that my students don't belittle interpretations they disagree with.		3.95	1.01	-1.07	.71
<b>IV. Student Leaning and Achievement Subscale</b>						
17	Grades are an impetus to high quality learning.		3.14	1.28	-.11	-1.32
18	Success in teaching is manifested in the high grades of students.		2.72	1.33	.45	-1.14
19	Grades are an essential tool for assessing learning.		2.78	1.24	.17	-1.28

20	High grades are essential for my students to get ahead in life.	3.45	1.27	-.51	-.95
<b>V. Teacher Role as Mentor Subscale</b>					
22	My main job as a teacher is to contribute to shaping the personality of the student.	4.38	.77	-1.45	2.27
23	It is very important that I be a role model for my students.	4.69	.72	-3.13	11.10
24	I feel great responsibility to help my students develop personality strengths that will help them cope with important issues in life.	4.52	.78	-2.10	5.11
25	The most important thing to me is for my students to feel that they can come to me with any personal problem.	4.23	.89	-1.32	1.59
26	My chief role is to serve as guide and leader for my students.	3.96	1.05	-.95	.13
27	It is important that my students remember me as a guide in life.	4.19	.93	-1.30	1.37
28	My role as a teacher is to guide students towards a particular value system.	4.06	.95	-1.03	.43

### Data Analyses

The main purpose of this research was to examine to what extent the translated version of the Pedagogical Beliefs of High School Islamic Education Teachers was valid and reliable. Four sub-questions were developed in order to investigate the validity and the reliability of the survey. The first sub-question is “Were appropriate translation procedures followed?” Prior to translating the survey, it was important to check every single item, and decide whether it is appropriate to the new population or not. Some parts of the survey content, such as equivalent meaning in the translation, was not easy to accomplish, because the original survey was built to

serve Jewish schools and Jewish education. Other items in the original survey were easy to be translated into Arabic language from a linguistic perspective; however, they failed to maintain their meanings and functions as in the original language. Specifically, part of the student learning and achievement subscale is student's behavior. Items related to the student's behavior had no equivalent meanings in the Islamic culture. For example, "studying Jewish subjects is a vital factor in bringing my students to observe the Jewish commandments carefully." Other items are "Studying Jewish subjects increases the feeling of belonging to the Jewish people," or "Learning the Jewish subjects strengthens students' connection to the land of Israel or the state of Israel." The researcher, in collaboration with the translation committee, decided to drop these items. Moreover, one item was hard to understand for meaning and function in the context of Jewish culture and thus was difficult to translate into the target language (Arabic). This item was "I think that due to their studies, students' are able to identify with Jewish legal authorities and commentators throughout the generations." Furthermore, it was necessary to revise and make some changes in the source version before the translation takes place. For example, it was important to add "Islamic teachings" to some items in the sanctity of the discipline subscale in order to be more understandable and clearer for the new population. Additionally, items regarding "defined – open" were removed from the translation process for several reasons. Firstly, this domain was meant to compare between secular subjects and religious subjects in the original survey, whereas the survey of this study was administered to serve solely Islamic education teachers. Secondly, the items regarding "defined-open" revolve around three points: the consensus about the content of subjects, the knowledge in subjects is well-defined, and that the subjects have clear boundaries. In fact, all these points do not apply to the subjects of Islamic education. The content of Islamic curricula is the least difficult to formulate because its content

“is derived primarily from the Quran, the *Sunnah*, and the history of Prophet Muhammad” (Hashim, 2005, p.138).

After considering the cultural relevance of the items, and the survey was culturally revised, the researcher with the committee translated the English version of the survey into Arabic. Then, back-translation process took place. A bilingual translator participated in this step. The translator took the Arabic version of the survey and translated back into English. The reason of doing this step is “to recast the meaning of the source version in the target language rather than to translate literally the words of the source version” (Chia-Ting & Parham, 2002. p. 583). The individual conducting of the back-translation for the target language (Arabic) worked independently with no contact with the person who translated the survey from the original language (English) into the target language (Arabic). The last step was to compare between the two versions of the survey (the original survey with the back-translation of the target language). All the translators worked together to discuss the differences between the two versions in a step called “negotiating differences.” Both versions were compared and no meaningful differences were found. Appendix C shows all the steps of translating the original survey into the target language (Arabic).

The second sub-question “Does a factor analysis suggest that the five domains hypothesized do account for survey responses?” was addressed by performing a series of running Exploratory Factor Analysis EFA in SPSS. To assess the dimensionality of a set of 28 items selected from a translated version of the Pedagogical Beliefs of High School Islamic Education Teachers’ Survey, Exploratory Factor Analysis EFA was performed using Maximum Likelihood (ML), Principle Axis Factoring (PAF), Alpha Factoring (AF), and Unweighted Least Squares

(ULS). The default criterion to retain only factors with eigenvalues greater than 1, and promax rotation was requested. The items included in the analysis consisted of five constructs: Static-Dynamic, Easy-Hard, Sanctity of the Discipline, Student Learning and Achievement, and Teacher Role as Mentor. Each item was rated on a 5-point scale that ranged from (1= Strongly Disagree) to (5= Strongly Agree). The correlation matrix (see Appendix D) indicated that these 28 items seemed to form several dimensions and separate groups. Low, moderate to high positive and negative correlations were found in each group of items.

When performing EFA using Maximum Likelihood ML, 8 factors were extracted greater than 1. Three reverse items contributed to one factor with very low communalities. These three reverse items failed to meet the minimum criteria set for this analysis of having a primary factor loading of .30 or above. These three reverse items were item 3, “The body of knowledge in my subject is not in a process of change,” item 4, “In my subject you can still teach today what they taught 30 years ago,” and item 6 “High school students must learn the core body of knowledge which does not change much over time.” In addition, two items were found with very low communalities, did not load above .30 on any factor, and formed their own factor. These two items were item 10, “Even students who succeed in other subjects might not do very well in my subject,” and item 21, “My students’ matriculation examination scores are very important to me.” The researcher decided to remove two of the reverse items 3 and 6 and items 10 and 21. Excluding these four items in the final stage of EFA resulted in a more interpretable solution.

An exploratory factor analysis was conducted to evaluate whether five constructs made sense for the translated version of the survey of the study using the remaining 24. Four methods of extraction were requested to assess the consistency among these methods. These four methods

were: Maximum Likelihood (ML), Principle Axis Factoring (PAF), Alpha Factoring (AF), and Unweighted Least Squares (ULS). Promax rotation was requested due to the degrees of correlations found among factors as shown in Table 3 and the correlations among the five subscales as shown in Table 4.

Table 3

*Correlation Matrix for the five factor solution*

Factors	Static Dynamic	Easy Hard	Sanctity of the Discipline	Student Learning	Teacher Role as Mentor
Static	1.000				
Dynamic					
Easy	.52	1.000			
Hard					
Sanctity of the Discipline	-.012	.08	1.000		
Student Learning	.14	.15	.14	1.000	
Teacher Role as Mentor	.19	.04	.26	.30	1.000

Table 4  
*Correlations Matrix among the Five Subscales*

Factors	Static Dynamic	Easy Hard	Sanctity of the Discipline	Student Learning	Teacher Role as Mentor
Static	1.000				
Dynamic					
Easy	.06	1.000			
Hard					
Sanctity of the Discipline	-.04	.28**	1.000		
Student Learning	-.05	.16*	.31**	1.000	
Teacher Role as Mentor	-.04	.008	.50**	.25**	1.000

\*\*correlation is significant at 0.01

\*correlation is significant at 0.05

Five factor solutions with eigenvalues greater than 1 were extracted. Choosing a five factor solution over an eight factor solution was preferred for several reasons. First, five factors solution was supported by the previous theoretical framework. Second, the “leveling off” of eigenvalues on the scree plot after extracting five factors was evident as shown in Figure 4. Third, the insufficient number of primary loadings and difficulty of interpreting the sixth factor and the subsequent factors guided the researcher to adopt the five factor solution.

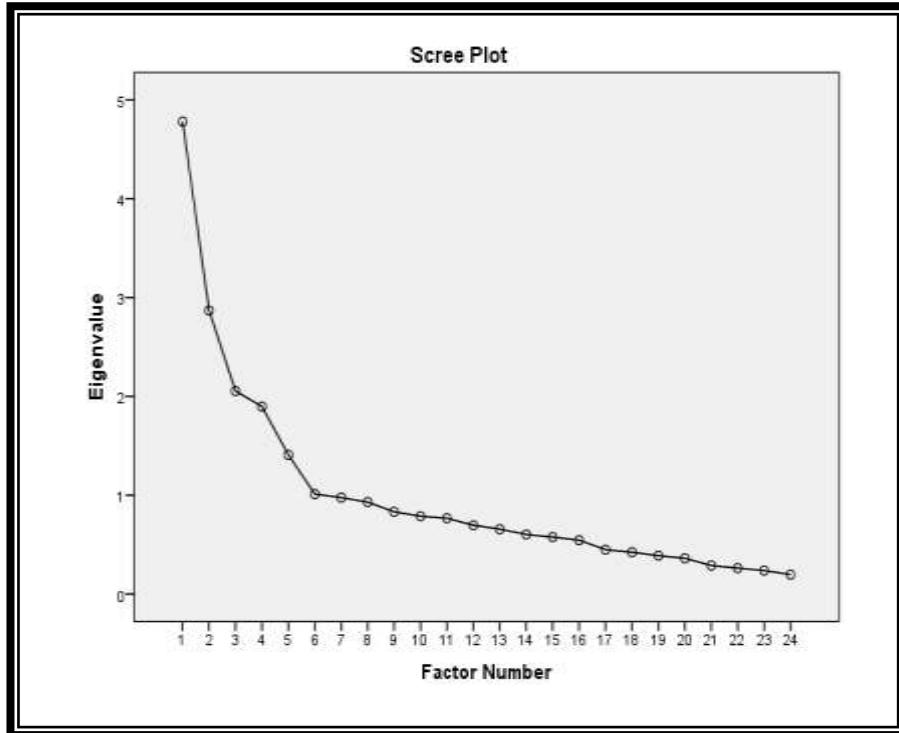


Figure 4: *Scree Plot of Eigenvalues for Factor 1 through 24.*

Results from this analysis including rotated factor loadings, communalities, and Sum Squared Loading (SSL) for the retained factors are summarized in Table 5. For Maximum Likelihood (ML), factor 1 accounted for 16.8 % of the variance, factor 2 accounted for 9.5 % of the variance, factor 3 accounted for 6.0 % of the variance, factor 4 accounted for 6.3% of the variance, and factor 5 accounted for 4.1% of the variance. All 5 factors accounted for 42.88 % of

the variance in this dataset. Communalities ( $h^2$ ) for variables were generally reasonable high, ranging from a low of .12 for item 4 (the reverse item) to a high of .83. Rotated factor loadings (see Table 5) were examined to assess the nature of these five retained factors. An arbitrary criterion was used to decide which factor loadings were large; a loading was interpreted as large if it exceeded .30 in absolute magnitude. Items 22, 23, and 24, had cross loadings about  $\pm .30$  between two factors: factor 1 and factor 2.

For Principle Axis Factoring (PAF), factor 1 accounted for 17.8 % of the variance, factor 2 accounted for 9.8 % of the variance, factor 3 accounted for 6.3 % of the variance, factor 4 accounted for 5.4% of the variance, and factor 5 accounted for 3.5% of the variance. All 5 factors accounted for 43.00 % of the variance in this dataset. Communalities ( $h^2$ ) for variables were generally reasonable high, ranging from a low of .13 for item 4 (the reverse item) to a high of .74. Rotated factor loadings (see Table 5) were examined to assess the nature of these five retained factors. Items 22, 23, and 24, had cross loadings between two factors: factor 1 and factor 2.

For Alpha Factoring (AF), factor 1 accounted for 17.5 % of the variance, factor 2 accounted for 9.4 % of the variance, factor 3 accounted for 6.5 % of the variance, factor 4 accounted for 5.7% of the variance, and factor 5 accounted for 3.6% of the variance. All 5 factors accounted for 42.90 % of the variance in this dataset. Communalities ( $h^2$ ) for variables were generally reasonable high, ranging from a low of .14 for item 4 (the reverse item) to a high of .71. Two items (22 and 24) had cross loadings between two factors: factor 1 and factor 2.

For Unweighted Least Square (ULS), factor 1 accounted for 17.8 % of the variance, factor 2 accounted for 9.8 % of the variance, factor 3 accounted for 6.3 % of the variance, factor 4 accounted for 5.4% of the variance, and factor 5 accounted for 3.5% of the variance. All 5

factors accounted for 43.00 % of the variance in this dataset. Communalities ( $h^2$ ) for variables were generally reasonable high, ranging from a low of .13 for item 4 (the reverse item) to a high of .74. Three items (22, 23, and 24) had cross loadings between two factors: factor 1 and factor 2. Overall, all the methods of extraction conducted in this analysis were highly consistent.

Table 5

*Rotated Factor Loadings: ML, PAF, AF, and ULS with Promax Rotation.*

Item #	ML						PAF						AF						ULS					
	F-1	F-2	F-3	F-4	F-5	H <sup>2</sup>	F-1	F-2	F-3	F-4	F-5	H <sup>2</sup>	F-1	F-2	F-3	F-4	F-5	H <sup>2</sup>	F-1	F-2	F-3	F-4	F-5	H <sup>2</sup>
	TM	SD	TD	LA	EH		SD	TM	TD	LA	EH		SD	TD	TM	LA	EH		SD	TM	TD	LA	EH	
PB-1	.01	.08	.86	-.0	.05	.75	.09	-.00	.84	-.08	.06	.74	.09	.83	-.01	-.0	.07	.71	.09	-.00	.85	-.08	.06	.74
PB-2	.07	-.04	.80	.02	-.0	.64	-.04	.07	.80	.02	-.00	.66	-.04	.83	.05	.0	-.01	.70	-.05	.07	.80	.02	-.00	.66
PB-4	-.17	.00	.32	.01	-.0	.12	-.02	-.17	.32	.01	-.08	.13	-.02	.34	-.20	.0	-.10	.14	-.02	.05	.33	.02	-.01	.13
PB-5	.07	-.02	.64	.02	-.0	.42	-.00	.05	.64	.02	-.01	.42	-.0	.61	.06	.0	.01	.38	-.00	-.17	.64	.01	-.08	.42
PB-7	-.2	-.0	.09	.13	.42	.27	-.1	-.1	.08	.12	.43	.28	-.16	.06	-.08	.1	.46	.29	-.13	-.12	.0	.12	.44	.28
PB-8	.05	-.08	-.1	-.1	.65	.36	-.1	.09	-.1	-.1	.65	.37	-.06	-.12	.11	-.1	.67	.39	-.05	.09	-.1	-.11	.66	.37
PB-9	.05	-.05	.11	-.0	.67	.47	-.0	.07	.11	-.0	.65	.46	.02	.13	.05	-.0	.63	.45	-.01	.07	.1	-.06	.65	.46
PB-11	.05	.19	-.2	-.0	.48	.31	.26	.00	-.1	-.0	.44	.30	.27	-.18	.00	-.0	.42	.29	.26	.00	-.1	-.00	.45	.31
PB-12	-.30	.10	.07	-.0	.41	.24	.04	-.2	.07	-.0	.42	.24	.03	.08	-.23	-.0	.41	.23	.04	-.24	.0	-.04	.42	.24
PB-13	-.13	.98	-.0	.02	-.0	.83	.92	-.1	-.0	.01	-.0	.71	.89	-.05	-.16	.0	-.02	.67	.92	-.17	-.0	.01	-.0	.71
PB-14	-.01	.84	-.0	-.0	.01	.69	.79	-.0	-.0	-.0	.04	.59	.75	-.06	-.0	-.0	.06	.54	.80	-.06	-.0	-.03	.04	.60
PB-15	-.03	.37	.12	.21	.11	.26	.45	-.1	.14	.23	.09	.30	.46	.12	-.13	.2	.12	.32	.46	-.13	.1	.23	.09	.31
PB-16	.14	.18	.01	.13	.26	.24	.30	.06	.02	.15	.23	.25	.32	.01	.04	.1	.22	.26	.30	.06	.0	.15	.23	.25
PB-17	.02	.01	-.0	.64	.00	.42	.00	.03	-.0	.65	-.0	.43	.03	.02	-.00	.66	-.04	.43	.006	.03	-.0	.65	-.01	.43
PB-18	.14	-.18	-.0	.65	-.0	.44	-.2	.19	-.0	.64	-.0	.43	-.23	.00	.21	.63	-.03	.43	-.21	.19	-.0	.64	-.03	.43

<b>PB-19</b>	-.18	.16	.02	<b>.64</b>	-.1	<b>.38</b>	.12	-.1	.00	<b>.65</b>	-.1	<b>.40</b>	.09	-.05	-.17	<b>.66</b>	-.12	<b>.40</b>	.12	-.19	.0	<b>.66</b>	-.15	<b>.40</b>
<b>PB-20</b>	.15	.05	-.0	<b>.47</b>	.10	<b>.33</b>	.09	.12	-.0	<b>.47</b>	.10	<b>.33</b>	.10	-.03	.11	<b>.47</b>	.10	<b>.32</b>	.09	.12	-.0	<b>.47</b>	.10	<b>.33</b>
<b>PB-22</b>	<b>.35</b>	<b>.38</b>	.06	-.0	-.0	<b>.41</b>	<b>.49</b>	<b>.24</b>	.07	-.0	-.0	<b>.41</b>	<b>.48</b>	.08	.24	-.0	-.0	<b>.40</b>	<b>.49</b>	<b>.24</b>	.0	-.05	-.01	<b>.41</b>
<b>PB-23</b>	<b>.44</b>	<b>.37</b>	.01	-.1	-.1	<b>.49</b>	<b>.64</b>	<b>.19</b>	.04	-.1	-.1	<b>.56</b>	<b>.71</b>	.05	.13	-.0	-.2	<b>.62</b>	<b>.64</b>	<b>.20</b>	.0	-.10	-.18	<b>.56</b>
<b>PB-24</b>	<b>.52</b>	<b>.29</b>	.00	-.0	.00	<b>.53</b>	<b>.54</b>	<b>.29</b>	.03	.00	-.0	<b>.54</b>	<b>.57</b>	.04	.24	.0	-.0	<b>.52</b>	<b>.55</b>	<b>.30</b>	.0	.00	-.04	<b>.54</b>
<b>PB-25</b>	<b>.67</b>	.06	-.0	.06	.05	<b>.53</b>	<b>.21</b>	<b>.56</b>	-.0	.06	.04	<b>.52</b>	.25	-.07	<b>.52</b>	.0	.03	<b>.49</b>	.21	<b>.57</b>	-.0	.06	.04	<b>.52</b>
<b>PB-26</b>	<b>.64</b>	-.2	.05	.09	.03	<b>.34</b>	-.1	<b>.66</b>	.04	.08	.05	<b>.40</b>	-.10	.07	<b>.63</b>	.0	.03	<b>.37</b>	-.14	<b>.67</b>	.0	.08	.05	<b>.40</b>
<b>PB-27</b>	<b>.69</b>	.02	.02	-.0	-.0	<b>.49</b>	.09	<b>.69</b>	.00	-.0	-.0	<b>.55</b>	.09	-.02	<b>.71</b>	-.0	-.02	<b>.57</b>	.09	<b>.70</b>	.0	.03	-.03	<b>.55</b>
<b>PB-28</b>	<b>.51</b>	-.09	.01	-.0	-.0	<b>.22</b>	-.0	<b>.50</b>	.01	-.0	-.0	<b>.24</b>	-.02	-.01	<b>.53</b>	-.0	-.03	<b>.27</b>	-.01	<b>.50</b>	.0	-.01	-.05	<b>.24</b>
<b>SSL</b>	<b>16.8</b>	<b>9.5</b>	<b>6.0</b>	<b>6.3</b>	<b>4.1</b>		<b>17.8</b>	<b>9.8</b>	<b>6.3</b>	<b>5.4</b>	<b>3.5</b>		<b>17.5</b>	<b>9.4</b>	<b>6.5</b>	<b>5.7</b>	<b>3.6</b>		<b>17.8</b>	<b>9.8</b>	<b>6.3</b>	<b>5.4</b>	<b>3.5</b>	
<b>%EV</b>	<b>42.88</b>					<b>43.00</b>					<b>42.90</b>					<b>43.00</b>								

PB: Pedagogical Beliefs' item; ML: Maximum Likelihood, PAF: Principle Axis Factoring; AF: Alpha Factoring; ULS: Unweighted Least Squares; TD: Static-Dynamic; EH: Easy – Hard; SD Sanctity of the Discipline; LA: Learning and Achievement; TM: Teacher Role as Mentor; SSL: Sums of Squared Loadings; and EV: Explained Variance.

The third sub-question in this research was, “Are results of the Arabic translation version consistent with results found with the original English-language version of the survey?” Means and Standard Deviations were computed for each item. Responses to the first subscale “**Static-Dynamic**” ranged from  $M=2.41$  to  $M=3.01$ . The item that received the highest mean ( $M=3.01$ ,  $SD=1.24$ ) was item 1, “There are constant changes in the subject I teach,” and the lowest mean ( $M=2.41$ ,  $SD=1.22$ ) was item 4, “In my subject you can still teach today what they taught 30 years ago.” Items’ means in this subscale were generally low. This also was found in the original survey (Iluz and Rich, 2009). The second subscale “**Easy-Hard**” ranged from a low of item 7 “Compared to other subjects the subject I teach is hard for students.” ( $M= 1.97$ ,  $SD=1.03$ ) to a high of item 11, “Students must work hard in my class to understand the material,” ( $M= 3.84$ ,  $SD=.99$ ). Low to moderate means in this subscale were consistent with the original survey administered to Jewish education teachers (Iluz and Rich, 2009). Means in the third subscale “**Sanctity of the Discipline**” were high. The item that received the lowest means was item 16, “It is very important to me that my students do not belittle interpretations they disagree with.” The rest of items in this subscale ranged from  $M=4.01$  to  $M=4.61$ . High means in this subscale were consistent with the original survey as well. Iluz and Rich (2009) reported that Jewish education teachers perceived their subjects as holier than any other subjects in schools. The fourth subscale “**Student Learning and Achievement**” ranged from  $M=2.72$  to  $3.45$ . The item that received the lowest mean was item 18, “Success in teaching is manifested in the high grades of students.” The highest mean was item 20, “High grades are essential for my students to get ahead in life.” Items’ means were low to moderate degree of belief, which were consistent with what was reported from the original survey (Iluz and Rich, 2009). Further, McCreery, Palmer and Voiels (2007) demonstrated that learning and achievement may be accomplished

through several methods such as assessment through observation, self-assessment, peer-assessment, recording student' learning especially in the recitation of the Holy Quran, and many other methods but not limited to grade as measured in this subscale. The last subscale “**Teacher Role as Mentor**,” its means were high. Item 26, “My chief role is to serve as guide and leader for my students,” was the lowest means in this subscale. Moreover, item 23, “It is very important that I be a role model for my students,” received the highest means ( $M=4.69$ ,  $SD=.72$ ). This finding was also supported in the original survey (Iluz and Rich, 2009). Table 6 reported the Means, Standard Deviations, rankings, and the degree of belief for each item.

**Table 6**  
*Means, Standard Deviations, Rankings, and Degree of Belief for each subscale*

N	Pedagogical Beliefs for High School Islamic Education Teachers' Survey	M	SD	Ranking	Degree of Belief
<b>I. Static – Dynamic Subscale</b>					
1	There are constant changes in the subject I teach.	3.01	1.24	4	M
2	The body of knowledge comprising my subject is constant changing.	2.75	1.22	2	L
4	In my subject you can still teach today what they taught 30 years ago.	2.41	1.22	1	L
5	The knowledge in my subject is constantly developing.	2.91	1.22	3	L
<b>II. Easy –Hard Subscale</b>					
7	Compared to other subjects the subject I teach is hard for students.	1.97	1.03	1	L
8	I want my students to think that the subject I teach requires a major effort from them.	3.24	1.25	4	M

9	The subject I teach demands a high level of analytical skill.	3.17	1.17	3	M
11	Students must work hard in my class to understand the material.	3.84	.99	5	M
12	I make significant academic demands from the students who study my subject.	2.49	1.10	2	L
<b>III. Sanctity of the Discipline Subscale</b>					
13	It's important to me that students relate to the subject I teach with a great deal of respect.	4.61	.78	4	H
14	When in class I want students to feel that the value of the subject I teach is different from other subjects.	4.55	.83	3	H
15	I will not tolerate arguments in class against our Islamic teachings in the subject.	4.01	1.24	2	H
16	It is very important to me that my students don't belittle interpretations they disagree with.	3.95	1.01	1	H
<b>IV. Student Leaning and Achievement Subscale</b>					
17	Grades are an impetus to high quality learning.	3.14	1.28	3	M
18	Success in teaching is manifested in the high grades of students.	2.72	1.33	1	L
19	Grades are an essential tool for assessing learning.	2.78	1.24	2	L
20	High grades are essential for my students to get ahead in life.	3.45	1.27	4	M
<b>V. Teacher Role as Mentor Subscale</b>					
22	My main job as a teacher is to contribute to shaping the personality of the student.	4.38	.77	5	H

23	It is very important that I be a role model for my students.	4.69	.72	7	H
24	I feel great responsibility to help my students develop personality strengths that will help them cope with important issues in life.	4.52	.78	6	H
25	The most important thing to me is for my students to feel that they can come to me with any personal problem.	4.23	.89	4	H
26	My chief role is to serve as guide and leader for my students.	3.96	1.05	1	H
27	It is important that my students remember me as a guide in life.	4.19	.93	3	H
28	My role as a teacher is to guide students towards a particular value system.	4.06	.95	2	H

*L: Low, M: Moderate, and H: High.*

The fourth sub-question was, “Are the survey and its subscales reliable?” This sub-question was addressed by computing the Cronbach Coefficient alpha for each subscale and comparing it with the Cronbach coefficient computed for the original survey. The alphas for each subscale were moderate to high for the original survey as well as for the current study. No substantial increases in alpha for any of the scales could have been accomplished by eliminating more items. Table 7 shows the alphas for each subscale for the original and the translated survey.

**Table 7**

*Cronbach's Alphas for the Original and the translated survey*

N	Scale Name	Alpha for the original Survey	Alpha for the translated survey
1	Static-Dynamic Subscale (4 items)	0.74	0.73
2	Easy-Hard Subscale (5 items)	0.76	0.63
3	Sanctity of the Discipline Subscale (4 items)	0.67	0.67
4	Student Learning and Achievement Subscale (4 items)	0.71	0.70
5	Teacher Role as Mentor Subscale (7 items)	0.81	0.80

## Chapter Five

### Discussion and Conclusion

This present study focused on how the translation of an English version of the Pedagogical Beliefs of Jewish Education could be valid and reliable to be administered for Arabic Islamic Education Teachers in Saudi Arabia. A translation-back translation procedure was implemented to ensure valid translation. The evaluation of the translation depended upon the internal structure using EFA. The original survey was revised in order to be culturally appropriate for the new population. Items with no equivalence meaning in the target language (Arabic) were either revised or removed.

Static-Dynamic Subscale was moderately supported by EFA techniques. For this subscale, three reverse items (3, 4, and 6) were poor. The three reverse items had either low communalities or insufficient loadings on any factors. The rest of items in this subscale had generally high interitem correlations and communalities except for item 4 ( $h^2=.12$  or .13 with other methods of extraction). Further, the subscale's estimate of internal consistency was good. It reached .73, which was actually lower compared to the original alpha of .74. The means for the four items in this subscale were generally low. This indicates that the Islamic education teachers perceived the subjects of Islamic education as more static than dynamic. This result was found in the finding of the original survey administered to Jewish education teachers (Iluz and Rich, 2009). Therefore, this subscale is generally good and would likely lead to good inferences about teacher's beliefs toward their discipline and whether it is more static or dynamic.

The Easy-Hard subscale was supported by EFA results. Item 10 had a very low communality. When item 10 was included in the analysis, it formed its own factor, and was

difficult to interpret. The rest of the items in this subscale had high quality. The communalities were reasonably high regardless method of extraction. Further, interitem correlations were found to be moderately high among items except on item 10. The internal consistency for this subscale was low ( $\alpha = .63$ ) and not reaching the acceptable minimum level. In addition, it was much lower than the alpha computed for the original survey ( $\alpha = .76$ ). This is likely because they are a few items in this subscale. The means for the five items in this subscale ranged from low to moderate degree of belief. The low to moderate means indicates that Islamic education teachers perceived their subjects as easier than any other subjects in school. This result was expected based on reviewing the previous studies. Iluz and Rich (2009) found the same result. They found that the prestige of the subjects such as math and science lead to be perceived difficulty. Consequently, this subscale is generally good, and may lead to produce useful inferences when measuring teacher's perceptions toward the simplicity and the difficulty of a particular subject.

Sanctity of the Discipline subscale consisted of four items. The communalities for these four items were reasonably good. Further, item loadings contributed to the factor and met the acceptable minimum criterion .30. Items' loadings were high. Additionally, interitem correlations were found high. The internal consistency for this subscale was low ( $\alpha = .67$ ), and consistent with what was reported for the original survey. The means for the four items were high, and were consistent with the finding of the original survey administered to Jewish education teachers. As anticipated from previous study, Iluz and Rich (2009) reported that Jewish education teachers perceived their subjects as holier than any other subjects in schools. Therefore, the quality of the items in this subscale is generally good, and hence would likely help researchers to have useful inferences about teacher's beliefs toward their discipline whether the

contents of their subjects are holier than any other subjects or the subjects are open to arguments and criticisms.

The Student Learning and Achievement subscale originally consisted of six items. Item 21 was removed from the analysis due to a very low communality and did not reach the acceptable minimum load to its factor. The commonalities for these four items were quite high. Items' loadings were very good. The internal consistency for this subscale was good ( $\alpha = .70$ ). This alpha level was consistent with what was reported for the original survey ( $\alpha = .71$ ). Items' means were low to moderate degree of belief, which were consistent with what was reported from the original survey (Iluz and Rich, 2009). McCreery, Palmer and Voilels (2007) demonstrated that learning and achievement may be accomplished through several methods such as assessment through observation, self-assessment, peer-assessment, recording student' learning especially in the recitation of the Holy Quran, and many other methods but not limited to grade as measured in this subscale.

Teacher Role as Mentor subscale consisted of seven items. Items commonalities were good. Commonalities for items 22, 23, 24, 25, 26, and 27 were  $h^2 > .40$ . Item 28 received the lowest commonality  $h^2 < .30$ . Items' loadings were very good. However, items 22, 23, 24, and 25 had cross loadings with the factor of Sanctity of the Discipline. The internal consistency was high ( $\alpha = .80$ ). This alpha was consistent with what was reported for the original survey ( $\alpha = .81$ ). Further, the means for the items in this subscale were high as well for questions regarding how Islamic education teachers perceived their role inside the classroom as mentor. This finding was also supported in the original survey (Iluz and Rich, 2009).

The whole survey was supported by EFA. Five factors were extracted from the 24 items. The five underlying factors resulted from consulting EFA were theoretically supported as well.

Translation back-translation technique was performed well and led to clear interpretations for EFA results.

### Limitations of the Study

The study has a number of limitations as follows:

1. This study focused on Islamic education teachers in secondary schools in only seven school districts: Jeddah, Madina, Mecca, Jubial, Yunbu, Umledg, and Al Wajh.
2. The researcher did not enter a female school, so the researcher chose a female teacher who was fully aware of the purpose of the study and its procedures to administer the questionnaires inside the female school. One must assume that procedures were followed correctly.
3. The researcher selected five domains of teachers' pedagogical beliefs among a variety of topics that were presented in the previous literature. These domains are as follows:

#### A. beliefs regarding the Discipline (16 items):

1. Static – Dynamic domain (6 items).
2. Easy – Hard domain (6 items).
3. Sanctity of the Discipline domain (4items).

#### B. beliefs regarding Student Learning and Achievement (5 items).

#### C. beliefs Regarding Teachers' Role and Responsibilities (7 items).

Other domains which may have been used in the original survey were not provided for this research.

4. Items in the original survey regarding student's behavior were removed due to there being no equivalent in the target language. Therefore, it is recommended that in future research collaboration between experts in the two cultures, religions, and languages be employed in order to minimize cultural and linguistic differences.

5. With a modest sample size ( $N=201$ ), Exploratory Factor Analysis (EFA) is a technique most appropriate specifically in the early development of the revised instrument. Confirmatory Factor Analysis (CFA) often comes as a follow-up to EFA. However, this research only employed the EFA due to the small sample size. Additionally, Raykov and Marcoulides (2011) suggest not using the same data sample used when conducting EFA to be used in CFA. Further, many of changes have been made to the original survey in order to be culturally appropriate for the new population; therefore, consulting only EFA is completely reasonable.

### The Implications for Practice

When applying an existing instrument to a new population, the items must be reviewed to ensure that the instrument is completely represented and that all items are relevant to the new population. Revisions to existing items, deletion of items, or development of new items are necessary. This research implies that reviewing the items through focus group, interviews, or surveys may provide feedback regarding the clarity and the relevance of the items. It is important that all items in any instrument should be reviewed by experts in the field of measurement.

The re-development of the existing instrument to serve a new population is a starting point in the research of pedagogical beliefs of Islamic education teachers. The final revised survey of pedagogical beliefs of Islamic education teachers provides solid ground for additional research in

teachers' beliefs in different areas. It is important to include more topics (more than what was selected in the survey of this research) to find a clear image of what affects teachers' judgments and decisions.

Building an instrument to explore teachers' beliefs may open more areas in the field of teachers' beliefs. For example, comparing teachers' beliefs in different subjects would be a new area of research in Saudi Arabia. Exploring the beliefs that secular subjects hold and how they are different from those who teach religious subjects will enrich the research in teachers' beliefs. Moreover, what affects and forms teachers' beliefs is an important implication of this research. This research implies that researchers should investigate in the factors affecting teachers' pedagogical beliefs; such as teaching experience, age, teacher gender, academic qualification, and school's location. These may provide the factors that contribute in shaping teachers' beliefs.

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## Appendix A

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 3/29/2011. HSCL #19347

### Information Statement

The Department of Psychology and Research in Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty.

This study will focus on a specific group of Saudi Arabian high schools' Islamic education teachers in Saudi Arabia, in order to investigate the Pedagogical Beliefs of High School Islamic Education Teachers. This will entail your completion of a 28-item questionnaire, which contains both demographic information and a section where you will rate items according to your perspective, using a 5-number scale (where 1=strongly disagree and 5= strongly agree). The questionnaire packet is expected to take 15 minutes to complete.

The content of the questionnaire should cause you no more discomfort than you would experience in your everyday life. Although participation may not benefit you directly, we believe that the information obtained from this study will help us gain a better understanding of what influences the instructional judgments and decisions of high school Islamic education teachers. The participants of the study should know that their names will not be associated in any way with the research findings.

If you would like additional information concerning this study before or after it is completed, please feel free to contact us by phone or email. Completion of the survey indicates your willingness to participate in this project and that you are at least eighteen. If you have any additional questions about your rights as a research participant, you may call (785) 864-7429 or write the Human Subjects Committee, Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, or email [mdenning@ku.edu](mailto:mdenning@ku.edu).

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## Appendix B

### The Original Version of the Instrument

#### First: Personal Information

1. Gender:  
 Male       Female
2. Educational Level:  
 Graduate     Undergraduate
3. Teaching Experience:  
Please specify (     ).
4. School's Location:  
 Holy City     Industrial City     Urban Area     Rural Area.
5. City Name: .....

#### Second: The Pedagogical Beliefs of Islamic Education Teachers' Survey.

1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree, and 5= Strongly Agree (SA).

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#### Beliefs regarding the Discipline

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##### I. Static – Dynamic Subscale

N	Item	SD	D	N	A	SA
1	There are constant changes in the subject I teach.	<input type="radio"/>				
2	The body of knowledge comprising my subject is constant changing.	<input type="radio"/>				
3	The body of knowledge in my subject is not in a process of change.	<input type="radio"/>				
4	In my subject you can still teach today what they taught 30	<input type="radio"/>				

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years ago.

- 5 The knowledge in my subject is constantly developing.
- 6 High school students must learn the core body of knowledge       
which does not change much over time.

## **II. Easy – Hard Subscale**

- 7 Compared to other subjects the subject I teach is hard for
- students.
- 8 I want my students to think that the subject I teach requires a       
major effort from them.
- 9 The subject I teach demands a high level of analytical skill.
- 10 Even students who succeed in other subjects might not do       
very well in my subject.
- 11 Students must work hard in my class to understand the       
material.
- 12 I make significant academic demands from the students who       
study my subject.

## **III. Sanctity of the Discipline Subscale** **SD D N A SA**

- 13 It's important to me that students relate to the subject I teach       
with a great deal of respect.
- 14 When in class I want students to feel that the value of the       
subject I teach is different from other subjects.
- 15 I will not tolerate arguments in class against our Islamic
-

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teachings in the subject.

- 16** It is very important to me that my students don't belittle interpretations they disagree with.

#### **Beliefs regarding Student's Learning**

<b>IV. Student Learning and Achievement Subscale</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
<b>17</b> Grades are an impetus to high quality learning.	<input type="radio"/>				
<b>18</b> Success in teaching is manifested in the high grades of students.	<input type="radio"/>				
<b>19</b> Grades are an essential tool for assessing learning.	<input type="radio"/>				
<b>20</b> High grades are essential for my students to get ahead in life.	<input type="radio"/>				
<b>21</b> My students' matriculation examination scores are very important to me.	<input type="radio"/>				

#### **Beliefs regarding Teacher Role and Responsibility**

<b>V. Teacher Role as Mentor Subscale</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
<b>22</b> My main job as a teacher is to contribute to shaping the personality of the student.	<input type="radio"/>				
<b>23</b> It is very important that I be a role model for my students.	<input type="radio"/>				
<b>24</b> I feel great responsibility to help my students develop personality strengths that will help them cope with important issues in life.	<input type="radio"/>				
<b>25</b> The most important thing to me is for my students to feel that they can come to me with any personal problem.	<input type="radio"/>				

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- 26** My chief role is to serve as guide and leader for my students.
- 27** It is important that my students remember me as a guide in life.
- 28** My role as a teacher is to guide students towards a particular value system.
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Thank you so much for the time you have spent in participating in the study

## Appendix C

### The Original Survey, the Target Language Survey, and the Back-Translation Survey

N	<b>The original Survey (English)</b>	<b>Step 1:</b>	<b>Step 2:</b>
		<b>The target language (Arabic)</b>	<b>The back-translation of the target language</b>
	<b>Static – Dynamic Subscale</b>	<b>الثبات والتغيير</b>	<b>Consistency and Change Subscale</b>
1	There are constant changes in the subject I teach.	يوجد تغيرات مستمرة في المادة التي أدرسها.	There are continuous changes in the subject that I teach.
2	The body of knowledge comprising my subject is constant changing.	يوجد تغيرات مستمرة في المحتوى المعرفي للمادة التي أدرسها.	There are continuous changes in the cognitive content of the course which I teach.
3	The body of knowledge in my subject is not in a process of change.	المحتوى المعرفي للمادة التي أدرسها غير خاضع لعمليات التغيير.	The cognitive content of the course that I teach is not subject to changing processes.
4	In my subject you can still teach today what they taught 30 years ago.	في مادتي، ما أدرسه اليوم هو ما تم تدريسيه في السنين الماضية.	In my course, what I teach today is what has been taught in the previous years.
5	The knowledge in my subject is constantly developing.	المحتوى المعرفي في مادتي الدراسية خاضع لعمليات تغيير مستمرة.	The cognitive content of the course that I teach is subject to changing processes.
6	High school students must learn the core body of knowledge which does not change much	طلاب المرحلة الثانوية لا بد أن يتعلموا الجزء الأساسي من المحتوى المعرفي للمادة التي	High school students need to learn the basic component of the cognitive content of the course that I teach,

	over time.	أدرسها والذي لا يتغير مع مرور الزمن.	which does not change over time.
<b>Easy – Hard Subscale</b>		<b>السهولة والصعوبة</b>	<b>Easiness and Difficulty Subscale</b>
7	Compared to other subjects the subject I teach is hard for students.	بالمقارنة بالمواد الأخرى, المادة التي أقوم بتدريسها صعبة على طلابي.	In comparison to other courses, the course that I teach is difficult to my students.
8	I want my students to think that the subject I teach requires a major effort from them.	أريد من طلابي أن يعرفوا أن المادة التي أدرسها تتطلب الكثير من الجهد.	I would like my students to know that the course which I teach requires a lot of effort.
9	The subject I teach demands a high level of analytical skill.	المادة التي أدرسها تحتاج إلى مستوى عال من مهارات التحليل.	The course which I teach requires high levels of analytical skills.
10	Even students who succeed in other subjects might not do very well in my subject.	أداء الطالب في المواد الأخرى بشكل جيد لا يعني بالضرورة أن يكون أداؤه جيدا في مادتي.	The good performance of a student in other courses does not necessarily mean that his/her performance will be good in my course.
11	Students must work hard in my class to understand the material.	فهم مواضيع المادة التي أقوم بتدريسها يستلزم من طلابي المذاكرة بشكل جيد.	Understanding the topics of the course that I teach requires my students to study well.
12	I make significant academic demands from the students who study my subject.	ألزم طلابي بالكثير من المتطلبات الأكademية في المادة التي أدرسها.	I request many academic requirements from my students in the course that I teach.
	<b>Sanctity of the Discipline Subscale</b>	<b>قداسة المادة الدراسية</b>	<b>Holiness of the Subject</b>
13	It's important to me that students relate to the subject I teach with a great deal of respect.	من المهم بالنسبة لي أن يتعامل الطلاب مع المادة التي أدرسها بقدر كبير من الاحترام.	It is important for me that the students deal with the course I teach with much respect.

<b>14</b>	When in class I want students to feel that the value of the subject I teach is different from other subjects.	أشاء تدريسي، أريد من طلابي أن يشعروا بقيمة المادة التي أدرسها وأنها تختلف عن المواد الأخرى.	During my teaching, I would like my students to feel the value of the course I teach and to realize that it is different from the other courses.
<b>15</b>	I will not tolerate arguments in class against our Islamic teachings in the subject.	لن أساهل مع النقاشات التي تتعارض مع التعاليم الإسلامية في مادتي.	I will not tolerate the discussions that contradict the teachings of Islam in my course.
<b>16</b>	It is very important to me that my students don't belittle interpretations they disagree with.	من المهم بالنسبة لي أن لا يقل طلابي من أهمية التفسيرات والآراء التي لا يتفقون معها.	It is important for me that my students do not underestimate the importance of the accounts and opinions with which they disagree.
<b>Student Learning and Achievement Subscale</b>		<b>التعلم والمستوى التحصيلي للطلاب</b>	<b>Learning and Student's Level of Achievement</b>
<b>17</b>	Grades are an impetus to high quality learning.	الدرجات المرتفعة هي الدافع لجودة تعليم عالية.	High grades are the motive for a high quality of learning.
<b>18</b>	Success in teaching is manifested in the high grades of students.	قياس نجاح المعلم في تدريسه يظهر جلياً من خلال درجات الطالب المرتفعة.	The measurement of the success of a teacher in his/her teaching appears clearly through the students' high grades.
<b>19</b>	Grades are an essential tool for assessing learning.	الدرجات هي أدلة أساسية لتقييم التعلم.	Grades are a basic tool to assess learning.
<b>20</b>	High grades are essential for my students to get ahead in life.	الدرجات العالية أمر أساسي لطلابي من أجل التقدم في الحياة.	High grades are a basic thing for my students to make progress in life.
<b>21</b>	My students' matriculation examination scores are very important to me.	مستوى الطلاب في اختبارات القبول في الجامعة أمر مهم بالنسبة لي.	The level of the students in University placement tests is an important thing to me.
<b>Teacher Role as Mentor Subscale</b>		<b>دور المعلم كمرشد</b>	<b>The Role of Teacher as a Guide</b>

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22	My main job as a teacher is to contribute to shaping the personality of the student.	عملي الأساسي كمعلم يكمن في المساهمة في تشكيل شخصية الطالب.	My main task as a teacher is to participate in shaping the student' personality.
23	It is very important that I be a role model for my students.	من المهم بالنسبة لي أن أكون قدوة لطلابي.	It is important for me to be an example to my students.
24	I feel great responsibility to help my students develop personality strengths that will help them cope with important issues in life.	أشعر بمسؤولية كبيرة لمساعدة الطلاب على تطوير نقاط القوة في شخصيتهم والتي تساعدهم على التعامل مع القضايا الهامة في الحياة.	I feel that I have a huge responsibility to assist students to develop the strength points in their personalities, which help them handle the important issues in life.
25	The most important thing to me is for my students to feel that they can come to me with any personal problem.	من المهم بالنسبة لي أن يشعر الطالب بأنه يستطيع أن يأتي إلى في أي مشكلة شخصية.	It is important for me that the student feels that he or she can come to me concerning any personal problem.
26	My chief role is to serve as guide and leader for my students.	دورني الأساسي يكمن في تقديم نفسي كمرشد وقائد لطلابي.	My main role lies in introducing myself as a guide and leader of my students.
27	It is important that my students remember me as a guide in life.	من المهم بالنسبة لي أن يتذكّرني الطالب كمرشد لهم في الحياة.	It is important for me that my students remember me as a guide for them in life.
28	My role as a teacher is to guide students towards a particular value system.	دورني كمعلم يكون في ارشاد الطلاب نحو نظام محدد من القيم.	My role as a teacher is to guide the students towards a specific system of values.

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## Appendix D

*Correlations Matrix with the Variance in the Diagonal for the Pedagogical Beliefs of Islamic Education Teachers' Survey*

Item	1	2	4	5	7	8	9	11	12	13	14	15	16	17	18	19	20	22	23	24	25	26	27	28
1	<i>1.5</i>																							
2	<i>.64</i>	<i>1.5</i>																						
4	<i>.55</i>	<i>.53</i>	<i>1.4</i>																					
5	<i>.21</i>	<i>.27</i>	<i>.16</i>	<i>1.5</i>																				
7	<i>.18</i>	<i>.13</i>	<i>.15</i>	<i>.01</i>	<i>1.0</i>																			
8	<i>.07</i>	<i>.07</i>	<i>.04</i>	<i>-.07</i>	<i>.29</i>	<i>1.5</i>																		
9	<i>.29</i>	<i>.22</i>	<i>.16</i>	<i>.05</i>	<i>.26</i>	<i>.37</i>	<i>1.3</i>																	
11	<i>-.04</i>	<i>-.06</i>	<i>-.03</i>	<i>-.08</i>	<i>.11</i>	<i>.27</i>	<i>.34</i>	<i>.99</i>																
12	<i>.14</i>	<i>.13</i>	<i>.05</i>	<i>.04</i>	<i>.26</i>	<i>.23</i>	<i>.27</i>	<i>.08</i>	<i>1.2</i>															
13	<i>.02</i>	<i>-.06</i>	<i>.03</i>	<i>-.11</i>	<i>-.08</i>	<i>.05</i>	<i>.07</i>	<i>.28</i>	<i>.01</i>	<i>.62</i>														
14	<i>.02</i>	<i>-.04</i>	<i>-.05</i>	<i>-.09</i>	<i>-.04</i>	<i>.09</i>	<i>.06</i>	<i>.29</i>	<i>.06</i>	<i>.77</i>	<i>.70</i>													
15	<i>.17</i>	<i>.11</i>	<i>.14</i>	<i>-.04</i>	<i>.10</i>	<i>.06</i>	<i>.19</i>	<i>.18</i>	<i>.18</i>	<i>.34</i>	<i>.27</i>	<i>1.5</i>												
16	<i>.16</i>	<i>.03</i>	<i>.08</i>	<i>-.05</i>	<i>.09</i>	<i>.13</i>	<i>.27</i>	<i>.31</i>	<i>.04</i>	<i>.27</i>	<i>.24</i>	<i>.33</i>	<i>1.0</i>											
17	<i>.05</i>	<i>.04</i>	<i>.02</i>	<i>.07</i>	<i>.06</i>	<i>.06</i>	<i>.13</i>	<i>.05</i>	<i>.04</i>	<i>.08</i>	<i>.07</i>	<i>.28</i>	<i>.18</i>	<i>1.6</i>										
18	<i>.01</i>	<i>.10</i>	<i>.15</i>	<i>.01</i>	<i>.16</i>	<i>.01</i>	<i>.06</i>	<i>.06</i>	<i>-.06</i>	<i>-.05</i>	<i>-.05</i>	<i>.07</i>	<i>.10</i>	<i>.45</i>	<i>1.7</i>									
19	<i>.01</i>	<i>.09</i>	<i>.01</i>	<i>-.04</i>	<i>.15</i>	<i>-.08</i>	<i>-.01</i>	<i>.05</i>	<i>-.02</i>	<i>.10</i>	<i>.03</i>	<i>.16</i>	<i>.18</i>	<i>.34</i>	<i>.34</i>	<i>1.5</i>								
20	<i>.01</i>	<i>.08</i>	<i>.08</i>	<i>-.05</i>	<i>.07</i>	<i>.19</i>	<i>.12</i>	<i>.14</i>	<i>.09</i>	<i>.17</i>	<i>.15</i>	<i>.27</i>	<i>.16</i>	<i>.36</i>	<i>.29</i>	<i>.32</i>	<i>1.6</i>							

22	.11	.04	.04	-.08	-.07	.04	.14	.09	-.05	.49	.45	.24	.20	.07	.02	-.02	.13	.59						
23	.03	-.01	.02	-.09	-.24	-.01	-.01	.19	-.20	.47	.42	.32	.23	-.01	-.11	-.02	.15	.47	.52					
24	.07	.03	.07	-.08	-.04	.09	.03	.23	-.09	.45	.48	.26	.23	.06	.07	.04	.24	.50	.65	.61				
25	.02	.03	.01	-.14	-.10	.09	.11	.18	-.12	.36	.40	.11	.28	.14	.15	.07	.19	.41	.39	.55	.80			
26	.12	.15	.01	-.03	.03	-.01	.11	.03	-.06	.11	.12	.11	.12	.12	.14	-.02	.28	.33	.18	.23	.40	1.1		
27	.09	.06	.08	-.17	-.17	.03	.01	.10	-.12	.32	.35	.10	.21	.11	.05	-.04	.15	.30	.37	.42	.52	.47	.86	
28	.02	.05	.11	-.16	-.11	-.01	.01	.05	-.13	.12	.15	.11	.11	.04	.11	-.05	.04	.22	.26	.21	.24	.31	.39	.91