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EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE

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Abstract: Research in contemporary education over the past few decades has encouraged considering the influence of non-cognitive factors such as learning styles in various learning behaviors. This study aims to examine the influence of the epistemic beliefs that consist of belief in knowledge and belief in learning on the field-dependent and field-independent learning styles. The sample of this study consisted of 129 students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute through the simple random sampling technique. The data collection technique used in this study was a questionnair. There are three scales used in this study, namely epistemological trust scale, dependent learning style and independent learning style. Data were analyzed by using Structural Equation Modeling. The results show that the belief in learning has a significant and positive effect on the field-dependent and field-independent learning style. Meanwhile, the belief in learning has only a significant and negative effect on the field-independent learning style and has no significant effect on field-dependent learning style. The results provide some insightful considerations regarding the utilization of epistemic beliefs for improving learners' interaction with surrounding context to obtain optimal academic performance.

Keywords: epistemic beliefs, field-dependent, field-independent, learning style

KEPERCAYAAN EPISTEMOLOGIS TENTANG GAYA BELAJAR DEPENDEN DAN GAYA BELAJAR INDEPENDEN

Abstrak: Penelitian dalam pendidikan kontemporer selama beberapa dekade terakhir telah mendorong mempertimbangkan pengaruh faktor non-kognitif seperti gaya belajar dalam berbagai perilaku belajar. Penelitian ini bertujuan untuk menguji pengaruh kepercayaan epistemologis yang terdiri dari kepercayaan tentang pengetahuan dan kepercayaan tentang belajar pada gaya belajar dependen dan independen. Sampel penelitian ini terdiri dari 129 siswa program studi Pendidikan Islam Anak Usia Dini, Jurusan Tarbiyah Sekolah Tinggi Agama Islam Negeri Kudus melalui teknik simple random sampling. Teknik pengumpulan data yang digunakan dalam penelitian ini adalah kuesioner dalam bentuk skala yang diadopsi dari penelitian sebelumnya. Ada tiga skala yang digunakan dalam penelitian ini, yaitu skala kepercayaan epistemologis, gaya belajar dependen dan gaya belajar independen. Data dianalisis dengan menggunakan model *Structural Equation Modeling*. Hasil penelitian menunjukkan bahwa kepercayaan dalam belajar memiliki efek yang signifikan dan positif pada gaya belajar dependen dan independen. Sementara itu, kepercayaan tentang belajar hanya memiliki efek yang signifikan dan negatif pada gaya belajar independen, dan tidak memiliki efek signifikan pada gaya belajar dependen. Hasilnya memberikan beberapa pertimbangan mendalam tentang pemanfaatan kepercayaan epistemologis untuk meningkatkan interaksi peserta didik dengan konteks sekitarnya untuk mendapatkan kinerja akademik yang optimal.

Kata kunci: kepercayaan epistemologis, dependen, independen dan gaya belajar

INTRODUCTION

Various studies of psychology and education reveal that the learning style is considered not directly obtained by students from within themselves as it is highly related with cognitive,

affective and psychological process (Felder & Silverman, 1988; Reid, 1987; Keefe, 1979; Mayer & Massa, 2003). It means that even though everyone has feelings, can develop his interests, and has the ability to think, everyone is different from other people's way of feeling, the way he develops his thoughts, the way he determines the development of his personal interests. Likewise, their tendency to choose a learning style obtained during the learning period will be profoundly affected by the learning process and the involvement of academic environment. In this context, students will relate to the external environment such as teachers, partners, and texts as references used in learning.

In addition, students' needs for the environment and their dependence on factors outside them will be strongly related to how they perceive the value of knowledge, the process of knowing, and the use of learning. This relates to the fact that the way a person processes and reacts to different needs that come from outside himself is different from how other people does it. Here, it should be noted that learning is not only solely related to the process at school, but also related to the extent to which students fundamentally believe the knowledge and learning (Muis, 2007; Bendixen, 2002).

Practically, understanding of knowledge will determine the extent to which students depend on the environment, learning style, and personal tendencies and orientation chosen for the success of the study. Students with an understanding that knowledge can be obtained by their own business are more likely to work individually and less dependent on others. Conversely, students with an understanding that knowledge can only be obtained from others or experts with higher knowledge authority will be more likely to be dependent on others and the environment. The first group is called field-independent learners which more tend to be actively involved in teams, work on group assignments and material discussion, and the second group is classified as field-dependent learners, which is is less dependent on teachers and peers, and more competitive in learning activities based on reading and writing (Kienhues, 2015). In short, field-dependent learners are less able to separate the context from the environment, while field-independent learners are better able to separate details from the context of the environment. In this view, they will have a high degree of involvement in the team, intensive interpersonal relationships, and participation in groups in the completion of tasks.

The extent to which students' understanding and belief in knowledge and learning and their effects on the choice of learning styles perceptions about academic achievements are more likely to involve the environment (field-dependent), or focusing on themselves (field independent) has not received much attention from previous studies (e.g Campbell et al., 2001; Higgins et al., 2007; Rohde & Thompson, 2007). In the last few decades, predictions of

academic success are highly emphasized on cognitive factors such as intelligence and academic ability, although recently, researchers in the field of education and social sciences have realized that non-cognitive factors and skills play an important role in the success and achievement of education (McKenzie & Schweitzer, 2001; Bastian et al., 2005; Nasim et al., 2005). It is strongly believed that non-cognitive skills factors are the same or even more important than the cognitive aspects of the education and work process (Khine, 2016). Furthermore, previous research tends to be more interested in examining aspects of learning styles that are more concrete to be tested empirically, compared to examining the relationship between learning styles and epistemic beliefs (Franzoni et al., 2008; Komarraju et al., 2011; Hsieh et al., 2011; Wong & Nunan, 2011). Here, it is assumed that student learning styles are the reflection of students' understanding and beliefs regarding knowledge and learning functions. This is related to the function of learning styles capable of explaining how individuals learn or how each person concentrates on the process, and masters difficult and new information through different perceptions. Style is personal characteristics for each person, and it serves to distinguish one person from another. Thus, in general the learning style is assumed to refer to the personalities, beliefs, choices, and behaviors used by individuals to assist in their learning in a conditioned situation. This study attempts empirically to examine the effect of epistemic beliefs in the forms of belief in knowledge and belief in learning in the choice of learning styles from field-dependent or field-independent. Conceptually, this study adopts the logic theory of contingency, primarily the logic of contradiction, where it is assumed that students with high belief, either in knowledge or in learning, will only have a logical choice regarding the selection of learning styles of field-dependent or field-independent. This model is considered more likely to be able to offer empirical evidence that is more consequent to the learner's belief epistemic level.

Epistemic Beliefs and Learning Style

One important and decisive factor in exposing the use of learning strategies used by students is the students' epistemic beliefs. The term epistemology in educational psychology is also referred to as personal epistemology. Epistemology is defined as how an individual believes in how knowledge occurs, how much knowledge is acquired, where it is acquired, and how the knowledge is constructed and evaluated. Furthermore, the focus of personal epistemology research is how the individual develops the concept of knowledge and how to know which concept is used in developing an understanding of the world (Hofer, 2002).

According to Schommer (1994), there is a distinction between epistemic research in philosophy and educational psychology. The difference is that if epistemic philosophy focuses on the investigation of truth, universality, and absolutism of knowledge, educational psychology focuses on how an individual believes in the nature of knowledge, and its effect on cognitive processes, such as how individual beliefs agree on the truth of information, organizing information, gain knowledge; and the justification of knowledge. Schommer (1994) defines epistemic belief as an individual belief in the nature of knowledge and belief in learning. Hofer and Pintrich (2002) suggest that research on epistemic beliefs in the field is categorized into three groups. The first group of research is intended to explain individual differences in educational life. Both of these studies emphasize the cause and effect relationship associated with individual differences. The third and most recent research is aimed at the relationship between epistemic beliefs and learning.

Schommer (1990) created a multidimensional epistemic model to explain the basic elements of the epistemological belief system. The results of the study of Jehng, Johnson, & Anderson, (1993) divide epistemological beliefs into two parts, namely beliefs about the nature of knowledge and beliefs about the nature of which initially epistemological beliefs have five independent dimensions. Belief in the nature of knowledge consists of three dimensions: (a) knowledge comes from people who know or are more expert (authority/expert knowledge) such as lecturers or reference books, compared to their own logic and thinking; (b) certain knowledge, absolute, unchanging, and not tentative, and; (c) an orderly process or also called rigid learning, is the result of an improvement from the simple dimension of knowledge. An organized process is a dimension of belief about whether learning is a process that individuals passively accept ready-made knowledge, or the process of formulating facts in which individuals independently construct their ideas. As for the belief about the nature of learning consists of two dimensions, namely; (a) learning quickly (quick learning) is a view that has a perspective of believing that to understand something is very dependent on the first time to learn it compared to students who have good learning strategies, believe that learning through a process of hard work can increase the effectiveness of learning strategies they use, and; (b) innate ability. Innate ability is the level of belief that the ability to learn is more inherent, than acquired or acquired (Ghufron, Alsa & Wirawan, 2013).

According to Montgomery and Groat (1998), there are several reasons why learning styles need to be noticed in the teaching process. It refers to the process to make the learning process more dialogical, to understand students more differently by adjusting the knowledge base of the learner, the suitability of the task, the main areas, and the careers to suit the

personality functions, talents, and to make the teaching process more appreciative of what students already have. Merriam and Caffarella (1991) define popular learning styles in adult education as the characteristics of the individual in how to process information, feel, and act in learning situations. James and Gardner (in Ghufron and Risnawita, 2012) argue that learning styles are a complex way of processing, storing and recalling what students have learned that they find most effective and efficient. Keefe (1979) defines learning styles as cognitive, affective, and physiological factors that present some relatively stable indicators of how students feel, relate to others and react to the learning environment.

There have been several theories regarding learning styles, one of which is a personality model in the form of field dependence and independence learning styles (Witkin, Oltman, Raskin, & Karp, 1971). Research on the learning styles of the Witkin, Oltman, Raskin, and Karp (1971) models, was carried out longitudinally from 1940 to 1970. and involved 1600 students. It is called individuals with field dependence learning styles when individuals perceive themselves to be controlled by the environment. As for individuals who have a field independence learning style is when individuals perceive themselves that most behaviors are not influenced by the environment.

Some typical characteristics possessed by individuals with field dependence learning styles, are that these individuals have extroverted traits, tend to be motivated from the outside and much influenced by community groups or learning and authority figures, experiencing more global events. (Witkin et al., 1971). Individuals with field dependence learning styles like the approach of an 'audience approach' when learning. As for individuals with field independence learning styles have an introverted nature, tend to be motivated from within or self (for example, self-study) and are less affected by social reinforcement, like competition, choose activities, and work structurally and Field-independent personalities have a social orientation lower, compared to field-dependent personalities. Individuals with field independence learning styles like learning that has clear goals and gives them more freedom of learning (Witkin et al., 1971).

Understanding the role of belief in knowledge is important in assisting learners in using effective learning strategies to achieve academic goals. Bra˚ten and Strømsø (2005) find in students, who believe that knowledge is stable and can only be obtained through the teacher's authority, will be less goal-oriented and more oriented to memorizing. Students with low belief or even doubt in knowledge structures such as simple structured knowledge. They will have little or no intrinsic learning orientation, no respect for learning activities, no control over learning and feeling that they can carry out a learning task. Similarly, students' beliefs in the

stability of knowledge such as absolute, tentative or transient knowledge and students' beliefs in the source of knowledge that knowledge comes from a more knowledgeable person, from the experience of an authority to convey knowledge or derive from his own thoughts followed by various evidence.

Huglin (2003) conducted research on personal epistemology with learning styles (feeler, thinker, sensor and intuiter) showed that these four learning styles differ significantly in terms of epistemic beliefs. Hashim, Ramly & Isaac (2009), exploring the relationship between personal epistemology and learning styles mediated by self-efficacy, found that personal belief has a direct and positive effect on learning style. Günes, Bati & Katranci (2017) by examining the epistemic view with learning styles in (pre-service) teachers in a preparatory program, show that, pre-service teachers adopt philosophical skepticism and tend to favor an active learning style. Furthermore, this study shows that statistically, significant relationships were found between participants' learning styles and their epistemic outlook. The personality models of field-dependent - field-independent learning style are the derivation of learning style theory (Witkin, Oltman, Raskin, & Karp, 1971). The individual considered as having a field-dependent learning style is when he perceives himself under the influence of the environment. Instead, the individual is considered to have a field-independent learning style when he perceives that most behaviors are not influenced by the environment. According to Luk (1998), field-dependent learners are individuals who are dependent on social skills, attitudes, perceptions, qualities, feelings and are strongly influenced by their physical and social background. Thus, individuals with this learning style depend on others to obtain information, guidance and attitude maintenance. Their characteristics inclued being open open (extrovert), requiring stimulation and motivation from the people and important people in their lives (Witkin et al., 1971). Conversely, individuals with a field-independent learning style tend to be more analytical, logical and more able to restructure and describe an aspect of the problem.

According to Schommer (1990), there are two beliefs about how to get knowledge, namely: (1) quick learning, both to be proficient quickly and gradually through a process that is easy or requires hard work, and (2) ability or skill innate ability in acquiring knowledge, both permanent and developing at any time. Belief in learning is assumed to be related to learning styles possessed by individuals whether field independence learning style or field dependent learning style. Individuals who believe that learning is a process that requires hard work and ability to develop tend to be egalitarian and loose, tend to be motivated from within or self (for example, self-study) and less affected by social reinforcement, liking competition, choosing activities, and working in a structured, and it will be easier to carry out the emancipation of the

learning process, or more specifically the tendency to have an interdependent field learning style. Conversely, individuals with a belief in learning who think that learning can be done quickly without processes and believe that learning requires innate abilities will have a tendency for individuals to perceive themselves controlled by the environment, learning tends to be motivated from the outside and much influenced by the surrounding environment with authority figures, and like the approach of an 'audience approach' when learning or more specifically the tendency to have field dependent learning styles.

Various studies have shown that epistemic beliefs influence the use of approaches in learning (Cano, 2005; Chan, 2003; 2004; Phan, 2006; Tsai & Chuang, 2005; Bra˚ten & Strømsø, 2005). Educational researchers such as Hofer & Pintrich (1997) claim that epistemic beliefs play an important role in academic behaviors, such as influencing the use of techniques in learning, for example, students who believe that the knowledge structure consists of cut-pieces that are not related to information, are likely to use memorization techniques as a learning technique and not an understanding technique. The study also concludes that students who see equally unchanging and stable knowledge tend to use memorization techniques of scientific facts. In contrast, learners who view knowledge as dynamic will prioritize aspects of information understanding (Davis, 1997). Moreover, students who believe that understanding technique is the best strategy in learning will have better results at the final exam than those who believe that memorizing techniques are the best (Davis, 1997). Chan (2007) argues that learning behavior is strongly influenced by students' beliefs in the nature of their knowledge and abilities. For field-independent learners, they are not much influenced by authority, social and external figures outside of themselves and more guided by their own needs. Their dominant characteristics are closed nature (introvert), tendency to perform an activity on their own initiative to the best of their abilities (e.g., self-study) even without being motivated or persuaded by the people around them, working regularly and focusing and loving competition. Compared with a field-dependent personality, field-independent individuals have a lower social orientation, (Witkin et al., 1971). Witkin et al. (1971) also said that individuals with a field-independent learning style have a clear purpose and more freedom to learn. Based on the above explanation, it can be reiterated that the suitability of the approach or learning style that students have in the learning process is very important.

METHODS

Research Design

This study seeks to examine the effect of epistemic beliefs on learning styles in students. Regarding the selection of respondents at the tertiary level, and not at the lower levels of the school, this study confirms to test the sustainability of the epistemic belief in learning styles. This is basically the selection of learning styles and beliefs in knowledge and knowing seems to have been formed during the previous education period.

Sampling

Population in this research is all students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute amounting to 252 students. The selection of students in the Early Childhood Islamic Education program is because these students become prospective teachers at the initial level of pre-school learning which forms the basis for the development o epistemological beliefs and learning styles for their students. The sampling technique in this study uses Proportional Random Sampling techniques by lottery. In random sampling each class in the population has the opportunity to be sampled. The proportion used to determine the number of samples in each class is 10% of the total number of students of the PIAUD study program. The number of samples obtained was 129 students. The sample distribution using Proportional Random Sampling in each batch can be seen in table 1 below:

Table 1. Distribution of samples

No	Semester (admission year)	Number of students	Female	Male	Sample
1	1 (2016)	52	52	0	26
2	3 (2015)	70	70	0	36
3	5 (2014)	64	62	2	33
4	7 (2013)	66	65	1	34
Total		**252**	**249**	**3**	**129**

The research location is in state Islamic universities on the grounds that the majority of the population in Indonesia are Muslim. In the Islamic community in Indonesia, the theological thought is often rooted in determinism. This theological flow combines reason and rational thought, emphasizing more on destiny. Specifically, the theology of determinism adopted by Indonesian Muslims in some respects, in particular regarding human power, have the opinion that humans do not have the influence to realize their actions, because their power and will are God's creation. It can also be said that the thinking of Islamic theology that developed in

Indonesia tended to be fatalistic, in which human movements were determined by God. This theological development will also have an effect on the epistemological beliefs of Indonesian Islamic students, especially in State Islamic College (STAIN) Kudus, such as how the views of knowledge and ways of knowing, which in turn, have an influence on belief and dependence on authority in knowledge and learning styles (Ghufron, Alsa and Wirawan, 2013).

Research Instruments

The method used to obtain data in this study is a questionnaire or questionnaire, a method based on self-report knowledge in personal beliefs. In this study there are three types of scales, namely the epistemological trust scale, the scale of dependent learning styles and the scale of independent learning styles. Epistemic belief in this research is divided into two components of belief, that are the belief in knowledge and belief in learning. The belief in knowledge (BK) is the individual's belief in the nature of knowledge which includes aspects, such as; (1) knowledge comes from an expert/knowledge expert, (2) certain knowledge, and (3) orderly process. Question items, then, were derived from these aspects, which are "I like the class where the lecturer before teaching sets the lecture unit". Meanwhile, the belief in learning (BL) is the individual's belief in learning that includes; (1) quick learning and (2) innate ability, with the items such as "If I can not understand something quickly, I usually have difficulty in learning it as a whole". This epistemic belief is expressed using a modified epistemic belief scale based on the scale of epistemic beliefs developed by Jehng, et al., (1993). In general, it can be said that the higher the value obtained the more the naive belief in learning.

Field-dependent learning style (FD) is a certain pattern that is stable when the individual accepts, interacts, absorbs, stores, organizes, and processes information with the individual's tendency to look at something globally, makes wide concept distinctions, shows social orientation and sets goals and reinforcement. This variable is expressed using the scale of the field-dependent learning style with the components as characterized by Witkin et al. (1971). Specifically, in the dimension of looking at things globally, the item proposed is "I don't mind reading or listening without understanding each word as long as I can take the main idea". Furthermore, individuals with a field-independent learning style (FI) have a tendency to look at things analytically, to make certain concepts distinct, to show an impersonal orientation and have their own designed goals. This variable is expressed using a field-independent learning style scale with components as characterized by Witkin et al. (1971). In the dimension of the individual looking at something analytically, the measuring question is "If I study, I understand the material in great detail (meticulously to the small things)."

Data Analysis Technique

The technique used to analyze data in this research was Structural Equation Models or also called Structural Equation Model. As for the needs of analysis, the software program Analysis of Moment Structures (AMOS) was used.

FINDINGS AND DISCUSSION

Findings

The age characteristics of respondents selected as samples of this study ranged from 18 to 26 years old. Almost all respondents were women. The majority of respondents aged between 18-20 years with a total of 91 people or 70.54%. In terms of the semester level, sampling is quite even at all levels of lecture (Table 2).

Table 2. Respondent Characteristics

Characteristics	Frequency	(%)
Gender:		
Female	127	98.45
Male	2	1.55
Age:		
18-20	91	70.54
21-25	24	18.60
>26	14	10.85

Descriptive statistics reveals the values of minimum, maximum, and mean and standard deviations for each question item. The mean value for each item ranged in the range of 2.33-3.05, indicating the medium tendency of the sample in the item in question (Table 3). Furthermore, to show how strong the influence between variables is, the correlation test with Pearson technique is done. Pearson correlation test results showed that out of 6 corelations, there were 3 significant correlational relationships between variables. Field-Dependent learning style (FD) is proven statistically to have negative and significant relation with Belief in Learning (BL) (FD-BL, -0.213, significant at 0.015). The results also show that the Field-Independent Learning variable has a positive and significant correlation in the two exogen constructs of Belief in Knowledge (FI-BL, 0.247; 0.005), and from belief in Learning (FI-BL, 0.320; 0.00) (Table 3).

Table 3. Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev
Belief in Knowledge (BK)				
BK1	1	4	2.65	.669
BK2	1	4	2.71	.687
BK3	1	4	2.83	.601
Belief in Learning (BL)				
BL1	1	4	2.40	.701
BL2	1	3	2.33	.700
Field-Dependent (FD)				
FD1	1	4	2.81	.808
FD2	1	4	2.84	.755
FD3	1	4	2.52	.708
FD4	1	4	2.81	.751
Field-Independent (FI)				
FI1	1	4	2.34	.815
FI2	1	4	3.05	.759
FI3	1	4	2.78	.763
FI4	1	4	2.88	.725

Testing with SEM requires a confirmatory test as a means to validate the measurement model of latent constructs (Awang, 2012). the results of the validity test showed that all items had a standardized loading score above 0.7 as a validity standard. Therefore, all items are declared valid. Moreover, the results of the reliability calculation of the field-dependence learning style scale obtained a value of 0.71, while the field-independence learning style gained a reliability score of 0.74. The results of the reliability of belief in knowledge gained 0.91, while belief in learning gained a score of 0.81. Thus, the entire variables obtain good reliability scores above 0.70. Thus, all the variables used have met reliability requirements (Table 4).

Table 4. Standarized Loading and Reliability

Variable	Loading Factor	Reliability
Belief about Knowledge		0.*91*
Certain knowledge	0.81	
Omniscient	0.77	
Simple Knowledge	0.86	
Belief about Learning		0.*81*
Innate Ability	0.94	
Quick Learning	0.74	
Field Dependent Learning Style		0.*71*
Viewing Matters Globally	0.76	
Creating Wide Concept Differences	0.87	
Showing Social Orientation	0.63	
Determine Goals and Improvements	0.75	
Field independent Learning Style		0.*74*
Viewing Matters Analytically	0.93	
Creating Particular Concept Differences	0.88	
Showing Impersonal Orientation	0.77	
Possessing Self Designed Goals	0.79	

According to Ghozali (2008) and Setiyowati, Pali, Wiyono & Triyono, (2019), before the analysis of the model of structural equation as a whole is done, a unidimensionality test on each construct is done with confirmatory factor analysis. This unidimensionality test is conducted to determine whether the constructor measurement indicators have provided reliable results. Unidimensionality test of this research is done by seeing whether the grain discrimination power (total grain correlation) of construct indicator in this research is significant. The test is also done by looking at the convergent validity or loading factor value of each indicator. Confirmatory analysis is performed between exogenous variables and between indogenous variables. In this model, there are exogenous variables that are epistemic beliefs that consist of belief in knowledge and belief in learning. The indogenous variables consist of two kinds of learning style that is field-dependent and field-independent. The results of confirmatory analysis between exogenous and indogenous variables indicate that the value of fit criteria has been achieved well. Similarly, the significance value of standarized loading parameter estimation is all above 0.05, so it can be said fit. After several proposed conditions are met, the next step is to test the hypothesis of testing theoretical model data with the overall empirical data.

The results of of analysis of full model on stage 1 the initial structural model analysis showed that Chi-Square 76.527 (DF = 60. p = 0.074), CMIN/DF = 1.275, GFI = 0.918, AGFI = 0.875, TLI = 0.975 and RMSEA = 0.046. That the criteria of acceptance requirements of the model can be fulfilled. Based on the result of the significance analysis p = 0.074 and yet it will try to re-estimate to get better result again. The re-estimation of the model in this study through model modification. Of course modification of the model can still be done provided that the fit model was not found in accordance with empirical data, and as long as it does not deviate from the proposed theory. Modification of the model can be done by modifying the direction of the relationship between variables that already exist in the model, adding or reducing latent variables or observation variables as far as still in the frame of conceptual research support model.

As for model modification analysis in this study is to see the output on Modification Indices (MI) on AMOS 16 analysis that has been done. The output of Modification Indices recommends about the error variables that must be done further to be modified is to connect, e1 with e7, e3 with e6 and e9 with e12. After that the retesting process is done, the results of this re-analysis show an improvement for the Goodness of Fit criteria (Figure 1).

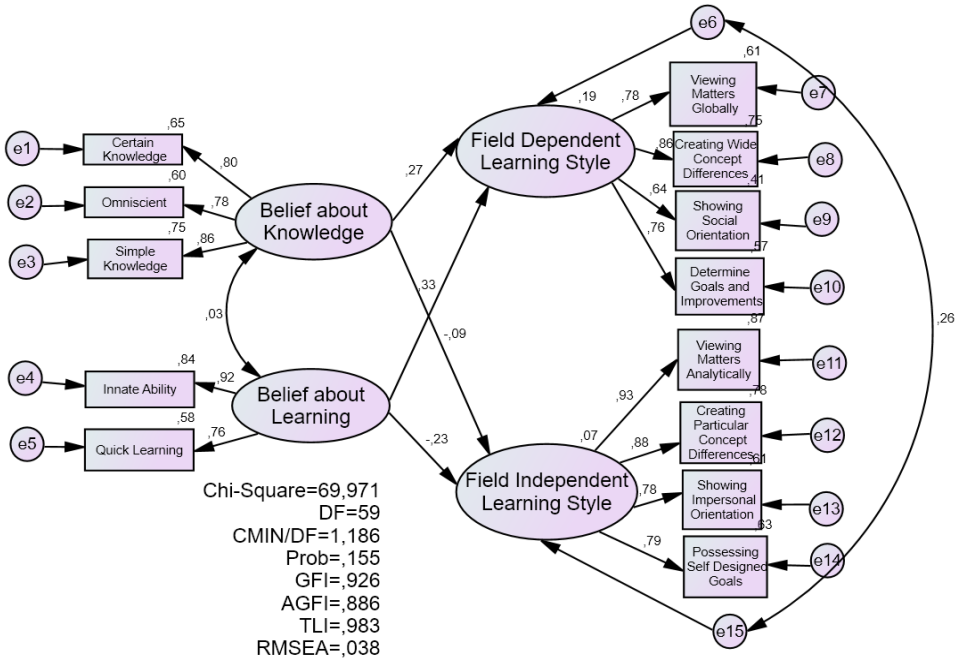

Figure 1. Results of the Modified Indices (MI) Analysis

Based on the retesting process it was found that the criterion requirement improved as the probability result from p = 0.074 to 0.155, the GFI value from 0.918 rose to 0.926, the

AGFI from 0.875 to 0.886, the TLI from 0.975 to 0.983 and the RMSEA decreased from 0.046 to 0.038.

Thus, the relationship model undergoes improvement (figure 1). Thus, it can be stated that the proposed model design does not differ significantly from empirical data. Based on these results then the researchers no longer need to modify the model, so the model can be used in this study. This means the hypothesis that there is a corresponding theoretical model with empirical data is acceptable.

Hypothesis testing is based on the value of estimated loading which is the evaluation of regression weight between latent variables and degree of freedom (df), and he critical ratio (C.R) value or t-arithmetic with probability value (*p*) of 0.05 for the belief level of 95% (Table 5).

Table 5. Regression Weights of the Causality Test

Hypothesis	Sign	Estimate	S.E.	C.R.	*P*	Evaluation
FD ← BK	+ (<0.05)	0.252	0.96	2.617	0.009	Accepted
FI ← BK	- (<0.05)	-0.119	0.124	-0.964	0.335	Rejected
FD ← BL	+ (<0.05)	0.267	0.105	2.542	0.011	Accepted
FI ← BL	- (<0.05)	-0.259	0.107	-2.416	0.016	Accepted

Statistical test results show that the belief in knowledge has a positive and significant effect on the field-dependence learning styles, which is indicated by estimate (r) 0.252 C.R value of 2.617 and a significance value (*p*) of 0.009<005. Accordingly, the first hypothesis is accepted. These results reveal that the higher belief in knowledge is more likely to increase learner dependence on the environment. In a related context, these results suggest the possibility that the high level of belief in knowledge will more likely to increase students' interpersonal abilities and improve the capacity of participation in teams and involvement in problem solving.

The next hypothesis attempts to examine the effect of the variable of belief in knowledge on field-independence learning styles. The test results showed r = -0.964 and C.R value of -0.964 with a significance value (*p*) 0.335> 005. This means that the variable belief in knowledge has a negative and significant effect on field-independence learning styles. Thus, the second hypotsis is rejected. In the affirmative question model, by analyzing the influence of epistemic beliefs on learning styles chosen by students, negative and insignificant results from the variables of belief in knowledge of field-independence learning styles reinforced that

students with a high degree of belief in knowledge were more likely to have field-dependence learning styles as shown by the acceptance of first hypothesis.

The third test is to analyze the influence of belief in learning on field-dependence learning styles. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style, which is indicated by the value of C.R 2.542 and p value 0.011. Then, the third hypothesis is accepted. These results reveal that high belief in learning will tend to make students have a field-dependence learning style. In other words, students will be more intensive in interpersonal relationships and team involvement, compared to solely relying on themselves which is a special characteristic of field-independence learning styles in the learning process.

The next test examined the fourth hypothesis that belief in learning had a negative and significant influence on field-independence learning styles. The test results reveal the value of C.R -2.416 and a significance value of 0.016. These results demonstrate that students' belief in the importance of learning is negatively related to the likelihood of them choosing the field-dependence learning style. Thus, the fourth hypothesis is accepted. These results affirmatively also confirm the third hypothesis, expressing the tendency of students to become more actively involved in the team and other people, and consider environmental factors, as they increasingly believe in the importance of learning. This is because students are considered to have only one rational choice of the learning style, either field-independence or dependence field. This entire test confirms that students' high belief in the importance of knowledge and intensive learning will be proportionally related to their awareness to involve the environment, peers, and groups, to support the success of their studies.

Discussion

The results show that the belief in learning has a positive and significant effect on field-dependent learning style. Moreover, it also has a negative and significant influence on the field-independent learning style. The results are in accordance with Hashim et al. (2009) who conducted research on the relationship between personal epistemology and learning styles mediated by self-efficacy which the results showed that personal belief has a positive and direct effect on learning style. An empirical examination from Günes, et al. (2017) on epistemic views with learning styles in the preparatory program shows that pre-service teachers adopt philosophical skepticism and tends to favor an active learning style, and there is a significant relationship between learning styles and the pre-service teacher’s epistemic outlook. The results of this study are also in accordance with Tümkaya (2012) conducted to 246 women and

242 men, a total of 488 students with the results showing that most students have learning styles of assimilation and converging. Moreover, there is no meaningful difference in the sub-dimension of beliefs about learning depends on effort in determining individual learning styles. On the other hand, it shows that in the sub-dimension of belief about learning depends on ability there is one unchanging assumption that is determined by diverging learning style.

From the results, this study highlights some noticeable findings regarding knowledge, learning style and epistemic beliefs. Knowledge is attributed as certain, absolute, unchanged, and not tentative. Students who have epistemic beliefs with field-dependent learning style tend to believe that knowledge is tentative and unpredictable, and does not believe that knowledge is fixed and immutable (Jehng et al., 1993). Furthermore, knowledge is believed to come from more knowledgeable or authority or expert with superior knowledge such as lecturers or reference books, compared to individual logic and thought. In this dimension, the student does not have a knowledge perspective, thus believing that the information from the reference book is true, and that the teacher must convey the material in the learning process (Jehng et al., 1993; Schommer, 1990). This is different for students who have more sophisticated epistemic beliefs with field-independent learning style, which emphasize more on the notion that knowledge comes from the constructs of their own thinking. According to Marchant (1992), students are inclined to accept what is delivered by the lecturer. Thus, this condition causes the individual to be very dependent on the environment and in learning to show field-independence. In terms of the orderly process as a contruct for epistemic belief, Jehng et al. (1993) explained that the dimensions of a regular process, or so-called rigid learning is the belief dimension of whether learning is a process that the individual passively receives the finished knowledge, or the process of formulating facts in which individuals independently build their ideas. In this dimension, the students' perspective prefers learning by taking the material exactly or in the same way as what they read in reference books and tend to follow what is written there from beginning to end (Jehng, et al., 1993).

Theoretically, the results of this study are insightful in understanding the influence of epistemic beliefs on knowledge and learning on learning styles that are very likely to be chosen by students. A high level of belief in learning and learning has a significant relationship with field-dependent learning styles. This implies that students are more likely to involve themselves in the team, discuss learning problems and tasks with partners and teachers, and have more interpersonal relationships with the surrounding context as a result of the increased belief in knowledge and learning. Furthermore, as a consequence of contingency logic, students with field-dependent learning styles are also more likely to reduce or negate the level of belief that

knowledge and learning can be obtained from their own abilities. Empirically, this is evidenced by the negative results and significant influence of beliefs on learning in field-independent learning styles. Practically, this study is useful for teachers and educators in designing learning models, where learning based on individual abilities such as reading and writing will make students more likely be field-independent learners, because of the lack of need for interaction with peers in learning activities. Furthermore, high student belief that academic abilities can only be achieved with the involvement of the surrounding environment will enable them to be active in groups. In this context, learning materials such as discussions and joint assignments will be able to encourage them to strive academically according to their epistemic beliefs.

CONCLUSION

This study aims to examine theoretical models of the influence of epistemic belief in the form of belief in knowledge and belief in learning to field-dependent learning style and field-independence. Statistical examination shows the positive and significant effect of exogenous variable in the form of variable of belief in knowledge on field-dependent learning style. However, this variable has no effect on field-independence learning style. In other side, the belief in learning had a significant positive effect on the field-dependent learning style and a negative and significant influence on the field-independent learning style. The result confirms that students believing that knowledge is absolute and certain will be more likely to adopt the belief that knowledge can only be obtained from people who are superiorly considered to know higher knowledge.

This research has been attempted to answer the problems posed by developing theoretical concepts which are then tested empirically. Although the findings of this study are promising, there are some limitations. The most noticeable is that although the SEM model shows that theoretical data is appropriate and accepted with empirical data, it is necessary to acknowledge that the overall purpose of this study is proven, namely the influence of the variable of belief on knowledge that has no effect on field independence learning styles. In addition, the sample involved only Early Childhood Education Study Program students whose 98.45 percent were female. The findings of this study henceforth may be possible gender bias.

In connection with the selection of limited research samples for undergraduate students, further research is expected to test the effect of epistemic beliefs on learning styles using the time-series method in a longitudinal design, to analyze more about the basis of the formation of epistemic beliefs and learning styles at each level of education, and their influence at the next level of education. Moreover, it is expected to analyze the factors that influence the

retention of this epistemic belief and and the possibility of fluctuations in the beliefs and changes in learning styles at certain levels of education.

Based on the results of this study it is suggested that educational institutions need to provide and enrich the development of epistemological beliefs in students in order to open opportunities for them to reflect not only on their learning style tendencies, but also about how and why certain learning styles are formed, and more specifically helps them to 'learn how to learn'.

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EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE

Abstract: Research in contemporary education over the past few decades has encouraged considering the influence of non-cognitive factors such as learning styles in various learning behaviors. This study aims to examine the influence of the epistemic beliefs that consist of belief in knowledge and belief in learning on the field-dependent and field-independent learning styles. The sample of this study consisted of 129 students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute through the simple random sampling technique. The data collection technique used in this study was a questionnair. There are three scales used in this study, namely epistemological trust scale, dependent learning style and independent learning style. Data were analyzed by using Structural Equation Modeling. The results show that the belief in learning has a significant and positive effect on the field-dependent and field-independent learning style. Meanwhile, the belief in learning has only a significant and negative effect on the field-independent learning style and has no significant effect on field-dependent learning style. The results provide some insightful considerations regarding the utilization of epistemic beliefs for improving learners' interaction with surrounding context to obtain optimal academic performance.

Keywords: epistemic beliefs, field-dependent, field-independent, learning style

KEPERCAYAAN EPISTEMOLOGIS TENTANG GAYA BELAJAR DEPENDEN DAN GAYA BELAJAR INDEPENDEN

Abstrak: Penelitian dalam pendidikan kontemporer selama beberapa dekade terakhir telah mendorong mempertimbangkan pengaruh faktor non-kognitif seperti gaya belajar dalam berbagai perilaku belajar. Penelitian ini bertujuan untuk menguji pengaruh kepercayaan epistemologis yang terdiri dari kepercayaan tentang pengetahuan dan kepercayaan tentang belajar pada gaya belajar dependen dan independen. Sampel penelitian ini terdiri dari 129 siswa program studi Pendidikan Islam Anak Usia Dini, Jurusan Tarbiyah Sekolah Tinggi Agama Islam Negeri Kudus melalui teknik simple random sampling. Teknik pengumpulan data yang digunakan dalam penelitian ini adalah kuesioner dalam bentuk skala yang diadopsi dari penelitian sebelumnya. Ada tiga skala yang digunakan dalam penelitian ini, yaitu skala kepercayaan epistemologis, gaya belajar dependen dan gaya belajar independen. Data dianalisis dengan menggunakan model *Structural Equation Modeling*. Hasil penelitian menunjukkan bahwa kepercayaan dalam belajar memiliki efek yang signifikan dan positif pada gaya belajar dependen dan independen. Sementara itu, kepercayaan tentang belajar hanya memiliki efek yang signifikan dan negatif pada gaya belajar independen, dan tidak memiliki efek signifikan pada gaya belajar dependen. Hasilnya memberikan beberapa pertimbangan mendalam tentang pemanfaatan kepercayaan epistemologis untuk meningkatkan interaksi peserta didik dengan konteks sekitarnya untuk mendapatkan kinerja akademik yang optimal.

Kata kunci: kepercayaan epistemologis, dependen, independen dan gaya belajar

INTRODUCTION

Various studies of psychology and education reveal that the learning style is considered not directly obtained by students from within themselves as it is highly related with cognitive,

affective and psychological process (Felder & Silverman, 1988; Reid, 1987; Keefe, 1979; Mayer & Massa, 2003). It means that even though everyone has feelings, can develop his interests, and has the ability to think, everyone is different from other people's way of feeling, the way he develops his thoughts, the way he determines the development of his personal interests. Likewise, their tendency to choose a learning style obtained during the learning period will be profoundly affected by the learning process and the involvement of academic environment. In this context, students will relate to the external environment such as teachers, partners, and texts as references used in learning.

In addition, students' needs for the environment and their dependence on factors outside them will be strongly related to how they perceive the value of knowledge, the process of knowing, and the use of learning. This relates to the fact that the way a person processes and reacts to different needs that come from outside himself is different from how other people does it. Here, it should be noted that learning is not only solely related to the process at school, but also related to the extent to which students fundamentally believe the knowledge and learning (Muis, 2007; Bendixen, 2002).

Practically, understanding of knowledge will determine the extent to which students depend on the environment, learning style, and personal tendencies and orientation chosen for the success of the study. Students with an understanding that knowledge can be obtained by their own business are more likely to work individually and less dependent on others. Conversely, students with an understanding that knowledge can only be obtained from others or experts with higher knowledge authority will be more likely to be dependent on others and the environment. The first group is called field-independent learners which more tend to be actively involved in teams, work on group assignments and material discussion, and the second group is classified as field-dependent learners, which is is less dependent on teachers and peers, and more competitive in learning activities based on reading and writing (Kienhues, 2015). In short, field-dependent learners are less able to separate the context from the environment, while field-independent learners are better able to separate details from the context of the environment. In this view, they will have a high degree of involvement in the team, intensive interpersonal relationships, and participation in groups in the completion of tasks.

The extent to which students' understanding and belief in knowledge and learning and their effects on the choice of learning styles perceptions about academic achievements are more likely to involve the environment (field-dependent), or focusing on themselves (field independent) has not received much attention from previous studies (e.g Campbell et al., 2001; Higgins et al., 2007; Rohde & Thompson, 2007). In the last few decades, predictions of

academic success are highly emphasized on cognitive factors such as intelligence and academic ability, although recently, researchers in the field of education and social sciences have realized that non-cognitive factors and skills play an important role in the success and achievement of education (McKenzie & Schweitzer, 2001; Bastian et al., 2005; Nasim et al., 2005). It is strongly believed that non-cognitive skills factors are the same or even more important than the cognitive aspects of the education and work process (Khine, 2016). Furthermore, previous research tends to be more interested in examining aspects of learning styles that are more concrete to be tested empirically, compared to examining the relationship between learning styles and epistemic beliefs (Franzoni et al., 2008; Komarraju et al., 2011; Hsieh et al., 2011; Wong & Nunan, 2011). Here, it is assumed that student learning styles are the reflection of students' understanding and beliefs regarding knowledge and learning functions. This is related to the function of learning styles capable of explaining how individuals learn or how each person concentrates on the process, and masters difficult and new information through different perceptions. Style is personal characteristics for each person, and it serves to distinguish one person from another. Thus, in general the learning style is assumed to refer to the personalities, beliefs, choices, and behaviors used by individuals to assist in their learning in a conditioned situation. This study attempts empirically to examine the effect of epistemic beliefs in the forms of belief in knowledge and belief in learning in the choice of learning styles from field-dependent or field-independent. Conceptually, this study adopts the logic theory of contingency, primarily the logic of contradiction, where it is assumed that students with high belief, either in knowledge or in learning, will only have a logical choice regarding the selection of learning styles of field-dependent or field-independent. This model is considered more likely to be able to offer empirical evidence that is more consequent to the learner's belief epistemic level.

Epistemic Beliefs and Learning Style

One important and decisive factor in exposing the use of learning strategies used by students is the students' epistemic beliefs. The term epistemology in educational psychology is also referred to as personal epistemology. Epistemology is defined as how an individual believes in how knowledge occurs, how much knowledge is acquired, where it is acquired, and how the knowledge is constructed and evaluated. Furthermore, the focus of personal epistemology research is how the individual develops the concept of knowledge and how to know which concept is used in developing an understanding of the world (Hofer, 2002).

According to Schommer (1994), there is a distinction between epistemic research in philosophy and educational psychology. The difference is that if epistemic philosophy focuses on the investigation of truth, universality, and absolutism of knowledge, educational psychology focuses on how an individual believes in the nature of knowledge, and its effect on cognitive processes, such as how individual beliefs agree on the truth of information, organizing information, gain knowledge; and the justification of knowledge. Schommer (1994) defines epistemic belief as an individual belief in the nature of knowledge and belief in learning. Hofer and Pintrich (2002) suggest that research on epistemic beliefs in the field is categorized into three groups. The first group of research is intended to explain individual differences in educational life. Both of these studies emphasize the cause and effect relationship associated with individual differences. The third and most recent research is aimed at the relationship between epistemic beliefs and learning.

Schommer (1990) created a multidimensional epistemic model to explain the basic elements of the epistemological belief system. The results of the study of Jehng, Johnson, & Anderson, (1993) divide epistemological beliefs into two parts, namely beliefs about the nature of knowledge and beliefs about the nature of which initially epistemological beliefs have five independent dimensions. Belief in the nature of knowledge consists of three dimensions: (a) knowledge comes from people who know or are more expert (authority/expert knowledge) such as lecturers or reference books, compared to their own logic and thinking; (b) certain knowledge, absolute, unchanging, and not tentative, and; (c) an orderly process or also called rigid learning, is the result of an improvement from the simple dimension of knowledge. An organized process is a dimension of belief about whether learning is a process that individuals passively accept ready-made knowledge, or the process of formulating facts in which individuals independently construct their ideas. As for the belief about the nature of learning consists of two dimensions, namely; (a) learning quickly (quick learning) is a view that has a perspective of believing that to understand something is very dependent on the first time to learn it compared to students who have good learning strategies, believe that learning through a process of hard work can increase the effectiveness of learning strategies they use, and; (b) innate ability. Innate ability is the level of belief that the ability to learn is more inherent, than acquired or acquired (Ghufron, Alsa & Wirawan, 2013).

According to Montgomery and Groat (1998), there are several reasons why learning styles need to be noticed in the teaching process. It refers to the process to make the learning process more dialogical, to understand students more differently by adjusting the knowledge base of the learner, the suitability of the task, the main areas, and the careers to suit the

personality functions, talents, and to make the teaching process more appreciative of what students already have. Merriam and Caffarella (1991) define popular learning styles in adult education as the characteristics of the individual in how to process information, feel, and act in learning situations. James and Gardner (in Ghufron and Risnawita, 2012) argue that learning styles are a complex way of processing, storing and recalling what students have learned that they find most effective and efficient. Keefe (1979) defines learning styles as cognitive, affective, and physiological factors that present some relatively stable indicators of how students feel, relate to others and react to the learning environment.

There have been several theories regarding learning styles, one of which is a personality model in the form of field dependence and independence learning styles (Witkin, Oltman, Raskin, & Karp, 1971). Research on the learning styles of the Witkin, Oltman, Raskin, and Karp (1971) models, was carried out longitudinally from 1940 to 1970. and involved 1600 students. It is called individuals with field dependence learning styles when individuals perceive themselves to be controlled by the environment. As for individuals who have a field independence learning style is when individuals perceive themselves that most behaviors are not influenced by the environment.

Some typical characteristics possessed by individuals with field dependence learning styles, are that these individuals have extroverted traits, tend to be motivated from the outside and much influenced by community groups or learning and authority figures, experiencing more global events. (Witkin et al., 1971). Individuals with field dependence learning styles like the approach of an 'audience approach' when learning. As for individuals with field independence learning styles have an introverted nature, tend to be motivated from within or self (for example, self-study) and are less affected by social reinforcement, like competition, choose activities, and work structurally and Field-independent personalities have a social orientation lower, compared to field-dependent personalities. Individuals with field independence learning styles like learning that has clear goals and gives them more freedom of learning (Witkin et al., 1971).

Understanding the role of belief in knowledge is important in assisting learners in using effective learning strategies to achieve academic goals. Bra˚ten and Strømsø (2005) find in students, who believe that knowledge is stable and can only be obtained through the teacher's authority, will be less goal-oriented and more oriented to memorizing. Students with low belief or even doubt in knowledge structures such as simple structured knowledge. They will have little or no intrinsic learning orientation, no respect for learning activities, no control over learning and feeling that they can carry out a learning task. Similarly, students' beliefs in the

stability of knowledge such as absolute, tentative or transient knowledge and students' beliefs in the source of knowledge that knowledge comes from a more knowledgeable person, from the experience of an authority to convey knowledge or derive from his own thoughts followed by various evidence.

Huglin (2003) conducted research on personal epistemology with learning styles (feeler, thinker, sensor and intuiter) showed that these four learning styles differ significantly in terms of epistemic beliefs. Hashim, Ramly & Isaac (2009), exploring the relationship between personal epistemology and learning styles mediated by self-efficacy, found that personal belief has a direct and positive effect on learning style. Günes, Bati & Katranci (2017) by examining the epistemic view with learning styles in (pre-service) teachers in a preparatory program, show that, pre-service teachers adopt philosophical skepticism and tend to favor an active learning style. Furthermore, this study shows that statistically, significant relationships were found between participants' learning styles and their epistemic outlook. The personality models of field-dependent - field-independent learning style are the derivation of learning style theory (Witkin, Oltman, Raskin, & Karp, 1971). The individual considered as having a field-dependent learning style is when he perceives himself under the influence of the environment. Instead, the individual is considered to have a field-independent learning style when he perceives that most behaviors are not influenced by the environment. According to Luk (1998), field-dependent learners are individuals who are dependent on social skills, attitudes, perceptions, qualities, feelings and are strongly influenced by their physical and social background. Thus, individuals with this learning style depend on others to obtain information, guidance and attitude maintenance. Their characteristics inclued being open open (extrovert), requiring stimulation and motivation from the people and important people in their lives (Witkin et al., 1971). Conversely, individuals with a field-independent learning style tend to be more analytical, logical and more able to restructure and describe an aspect of the problem.

According to Schommer (1990), there are two beliefs about how to get knowledge, namely: (1) quick learning, both to be proficient quickly and gradually through a process that is easy or requires hard work, and (2) ability or skill innate ability in acquiring knowledge, both permanent and developing at any time. Belief in learning is assumed to be related to learning styles possessed by individuals whether field independence learning style or field dependent learning style. Individuals who believe that learning is a process that requires hard work and ability to develop tend to be egalitarian and loose, tend to be motivated from within or self (for example, self-study) and less affected by social reinforcement, liking competition, choosing activities, and working in a structured, and it will be easier to carry out the emancipation of the

learning process, or more specifically the tendency to have an interdependent field learning style. Conversely, individuals with a belief in learning who think that learning can be done quickly without processes and believe that learning requires innate abilities will have a tendency for individuals to perceive themselves controlled by the environment, learning tends to be motivated from the outside and much influenced by the surrounding environment with authority figures, and like the approach of an 'audience approach' when learning or more specifically the tendency to have field dependent learning styles.

Various studies have shown that epistemic beliefs influence the use of approaches in learning (Cano, 2005; Chan, 2003; 2004; Phan, 2006; Tsai & Chuang, 2005; Bra˚ten & Strømsø, 2005). Educational researchers such as Hofer & Pintrich (1997) claim that epistemic beliefs play an important role in academic behaviors, such as influencing the use of techniques in learning, for example, students who believe that the knowledge structure consists of cut-pieces that are not related to information, are likely to use memorization techniques as a learning technique and not an understanding technique. The study also concludes that students who see equally unchanging and stable knowledge tend to use memorization techniques of scientific facts. In contrast, learners who view knowledge as dynamic will prioritize aspects of information understanding (Davis, 1997). Moreover, students who believe that understanding technique is the best strategy in learning will have better results at the final exam than those who believe that memorizing techniques are the best (Davis, 1997). Chan (2007) argues that learning behavior is strongly influenced by students' beliefs in the nature of their knowledge and abilities. For field-independent learners, they are not much influenced by authority, social and external figures outside of themselves and more guided by their own needs. Their dominant characteristics are closed nature (introvert), tendency to perform an activity on their own initiative to the best of their abilities (e.g., self-study) even without being motivated or persuaded by the people around them, working regularly and focusing and loving competition. Compared with a field-dependent personality, field-independent individuals have a lower social orientation, (Witkin et al., 1971). Witkin et al. (1971) also said that individuals with a field-independent learning style have a clear purpose and more freedom to learn. Based on the above explanation, it can be reiterated that the suitability of the approach or learning style that students have in the learning process is very important.

METHODS

Research Design

This study seeks to examine the effect of epistemic beliefs on learning styles in students. Regarding the selection of respondents at the tertiary level, and not at the lower levels of the school, this study confirms to test the sustainability of the epistemic belief in learning styles. This is basically the selection of learning styles and beliefs in knowledge and knowing seems to have been formed during the previous education period.

Sampling

Population in this research is all students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute amounting to 252 students. The selection of students in the Early Childhood Islamic Education program is because these students become prospective teachers at the initial level of pre-school learning which forms the basis for the development o epistemological beliefs and learning styles for their students. The sampling technique in this study uses Proportional Random Sampling techniques by lottery. In random sampling each class in the population has the opportunity to be sampled. The proportion used to determine the number of samples in each class is 10% of the total number of students of the PIAUD study program. The number of samples obtained was 129 students. The sample distribution using Proportional Random Sampling in each batch can be seen in table 1 below:

Table 1. Distribution of samples

No	Semester (admission year)	Number of students	Female	Male	Sample
1	1 (2016)	52	52	0	26
2	3 (2015)	70	70	0	36
3	5 (2014)	64	62	2	33
4	7 (2013)	66	65	1	34
Total		**252**	**249**	**3**	**129**

The research location is in state Islamic universities on the grounds that the majority of the population in Indonesia are Muslim. In the Islamic community in Indonesia, the theological thought is often rooted in determinism. This theological flow combines reason and rational thought, emphasizing more on destiny. Specifically, the theology of determinism adopted by Indonesian Muslims in some respects, in particular regarding human power, have the opinion that humans do not have the influence to realize their actions, because their power and will are God's creation. It can also be said that the thinking of Islamic theology that developed in

Indonesia tended to be fatalistic, in which human movements were determined by God. This theological development will also have an effect on the epistemological beliefs of Indonesian Islamic students, especially in State Islamic College (STAIN) Kudus, such as how the views of knowledge and ways of knowing, which in turn, have an influence on belief and dependence on authority in knowledge and learning styles (Ghufron, Alsa and Wirawan, 2013).

Research Instruments

The method used to obtain data in this study is a questionnaire or questionnaire, a method based on self-report knowledge in personal beliefs. In this study there are three types of scales, namely the epistemological trust scale, the scale of dependent learning styles and the scale of independent learning styles. Epistemic belief in this research is divided into two components of belief, that are the belief in knowledge and belief in learning. The belief in knowledge (BK) is the individual's belief in the nature of knowledge which includes aspects, such as; (1) knowledge comes from an expert/knowledge expert, (2) certain knowledge, and (3) orderly process. Question items, then, were derived from these aspects, which are "I like the class where the lecturer before teaching sets the lecture unit". Meanwhile, the belief in learning (BL) is the individual's belief in learning that includes; (1) quick learning and (2) innate ability, with the items such as "If I can not understand something quickly, I usually have difficulty in learning it as a whole". This epistemic belief is expressed using a modified epistemic belief scale based on the scale of epistemic beliefs developed by Jehng, et al., (1993). In general, it can be said that the higher the value obtained the more the naive belief in learning.

Field-dependent learning style (FD) is a certain pattern that is stable when the individual accepts, interacts, absorbs, stores, organizes, and processes information with the individual's tendency to look at something globally, makes wide concept distinctions, shows social orientation and sets goals and reinforcement. This variable is expressed using the scale of the field-dependent learning style with the components as characterized by Witkin et al. (1971). Specifically, in the dimension of looking at things globally, the item proposed is "I don't mind reading or listening without understanding each word as long as I can take the main idea". Furthermore, individuals with a field-independent learning style (FI) have a tendency to look at things analytically, to make certain concepts distinct, to show an impersonal orientation and have their own designed goals. This variable is expressed using a field-independent learning style scale with components as characterized by Witkin et al. (1971). In the dimension of the individual looking at something analytically, the measuring question is "If I study, I understand the material in great detail (meticulously to the small things)."

Data Analysis Technique

The technique used to analyze data in this research was Structural Equation Models or also called Structural Equation Model. As for the needs of analysis, the software program Analysis of Moment Structures (AMOS) was used.

FINDINGS AND DISCUSSION

Findings

The age characteristics of respondents selected as samples of this study ranged from 18 to 26 years old. Almost all respondents were women. The majority of respondents aged between 18-20 years with a total of 91 people or 70.54%. In terms of the semester level, sampling is quite even at all levels of lecture (Table 2).

Table 2. Respondent Characteristics

Characteristics	Frequency	(%)
Gender:		
Female	127	98.45
Male	2	1.55
Age:		
18-20	91	70.54
21-25	24	18.60
>26	14	10.85

Descriptive statistics reveals the values of minimum, maximum, and mean and standard deviations for each question item. The mean value for each item ranged in the range of 2.33-3.05, indicating the medium tendency of the sample in the item in question (Table 3). Furthermore, to show how strong the influence between variables is, the correlation test with Pearson technique is done. Pearson correlation test results showed that out of 6 corelations, there were 3 significant correlational relationships between variables. Field-Dependent learning style (FD) is proven statistically to have negative and significant relation with Belief in Learning (BL) (FD-BL, -0.213, significant at 0.015). The results also show that the Field-Independent Learning variable has a positive and significant correlation in the two exogen constructs of Belief in Knowledge (FI-BL, 0.247; 0.005), and from belief in Learning (FI-BL, 0.320; 0.00) (Table 3).

Table 3. Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev
Belief in Knowledge (BK)				
BK1	1	4	2.65	.669
BK2	1	4	2.71	.687
BK3	1	4	2.83	.601
Belief in Learning (BL)				
BL1	1	4	2.40	.701
BL2	1	3	2.33	.700
Field-Dependent (FD)				
FD1	1	4	2.81	.808
FD2	1	4	2.84	.755
FD3	1	4	2.52	.708
FD4	1	4	2.81	.751
Field-Independent (FI)				
FI1	1	4	2.34	.815
FI2	1	4	3.05	.759
FI3	1	4	2.78	.763
FI4	1	4	2.88	.725

Testing with SEM requires a confirmatory test as a means to validate the measurement model of latent constructs (Awang, 2012). the results of the validity test showed that all items had a standardized loading score above 0.7 as a validity standard. Therefore, all items are declared valid. Moreover, the results of the reliability calculation of the field-dependence learning style scale obtained a value of 0.71, while the field-independence learning style gained a reliability score of 0.74. The results of the reliability of belief in knowledge gained 0.91, while belief in learning gained a score of 0.81. Thus, the entire variables obtain good reliability scores above 0.70. Thus, all the variables used have met reliability requirements (Table 4).

Table 4. Standarized Loading and Reliability

Variable	Loading Factor	Reliability
Belief about Knowledge		*0.91*
Certain knowledge	0.81	
Omniscient	0.77	
Simple Knowledge	0.86	
Belief about Learning		*0.81*
Innate Ability	0.94	
Quick Learning	0.74	
Field Dependent Learning Style		*0.71*
Viewing Matters Globally	0.76	
Creating Wide Concept Differences	0.87	
Showing Social Orientation	0.63	
Determine Goals and Improvements	0.75	
Field independent Learning Style		*0.74*
Viewing Matters Analytically	0.93	
Creating Particular Concept Differences	0.88	
Showing Impersonal Orientation	0.77	
Possessing Self Designed Goals	0.79	

According to Ghozali (2008) and Setiyowati, Pali, Wiyono & Triyono, (2019), before the analysis of the model of structural equation as a whole is done, a unidimensionality test on each construct is done with confirmatory factor analysis. This unidimensionality test is conducted to determine whether the constructor measurement indicators have provided reliable results. Unidimensionality test of this research is done by seeing whether the grain discrimination power (total grain correlation) of construct indicator in this research is significant. The test is also done by looking at the convergent validity or loading factor value of each indicator. Confirmatory analysis is performed between exogenous variables and between indogenous variables. In this model, there are exogenous variables that are epistemic beliefs that consist of belief in knowledge and belief in learning. The indogenous variables consist of two kinds of learning style that is field-dependent and field-independent. The results of confirmatory analysis between exogenous and indogenous variables indicate that the value of fit criteria has been achieved well. Similarly, the significance value of standarized loading parameter estimation is all above 0.05, so it can be said fit. After several proposed conditions are met, the next step is to test the hypothesis of testing theoretical model data with the overall empirical data.

The results of of analysis of full model on stage 1 the initial structural model analysis showed that Chi-Square 76.527 (DF = 60. p = 0.074), CMIN/DF = 1.275, GFI = 0.918, AGFI = 0.875, TLI = 0.975 and RMSEA = 0.046. That the criteria of acceptance requirements of the model can be fulfilled. Based on the result of the significance analysis p = 0.074 and yet it will try to re-estimate to get better result again. The re-estimation of the model in this study through model modification. Of course modification of the model can still be done provided that the fit model was not found in accordance with empirical data, and as long as it does not deviate from the proposed theory. Modification of the model can be done by modifying the direction of the relationship between variables that already exist in the model, adding or reducing latent variables or observation variables as far as still in the frame of conceptual research support model.

As for model modification analysis in this study is to see the output on Modification Indices (MI) on AMOS 16 analysis that has been done. The output of Modification Indices recommends about the error variables that must be done further to be modified is to connect, e1 with e7, e3 with e6 and e9 with e12. After that the retesting process is done, the results of this re-analysis show an improvement for the Goodness of Fit criteria (Figure 1).

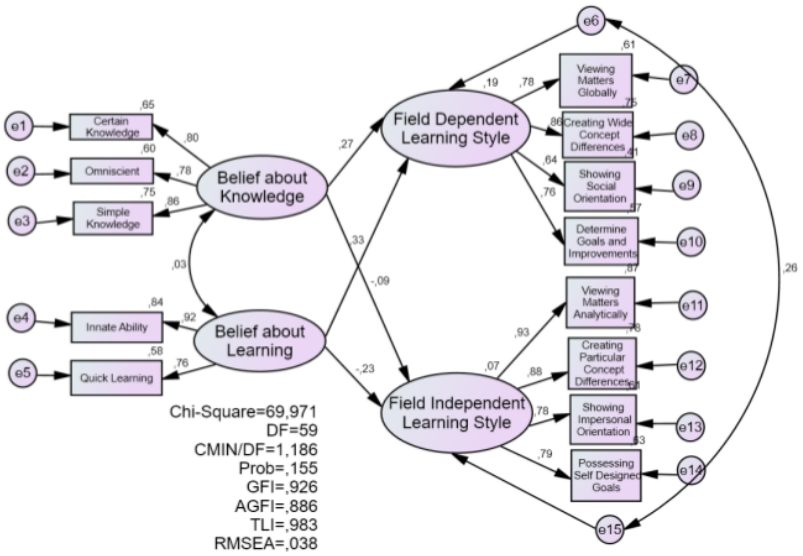

Figure 1. Results of the Modified Indices (MI) Analysis

Based on the retesting process it was found that the criterion requirement improved as the probability result from p = 0.074 to 0.155, the GFI value from 0.918 rose to 0.926, the

AGFI from 0.875 to 0.886, the TLI from 0.975 to 0.983 and the RMSEA decreased from 0.046 to 0.038.

Thus, the relationship model undergoes improvement (figure 1). Thus, it can be stated that the proposed model design does not differ significantly from empirical data. Based on these results then the researchers no longer need to modify the model, so the model can be used in this study. This means the hypothesis that there is a corresponding theoretical model with empirical data is acceptable.

Hypothesis testing is based on the value of estimated loading which is the evaluation of regression weight between latent variables and degree of freedom (df), and he critical ratio (C.R) value or t-arithmetic with probability value (*p*) of 0.05 for the belief level of 95% (Table 5).

Table 5. Regression Weights of the Causality Test

Hypothesis	Sign	Estimate	S.E.	C.R.	*P*	Evaluation
FD ← BK	+ (<0.05)	0.252	0.96	2.617	0.009	Accepted
FI ← BK	- (<0.05)	-0.119	0.124	-0.964	0.335	Rejected
FD ← BL	+ (<0.05)	0.267	0.105	2.542	0.011	Accepted
FI ← BL	- (<0.05)	-0.259	0.107	-2.416	0.016	Accepted

Statistical test results show that the belief in knowledge has a positive and significant effect on the field-dependence learning styles, which is indicated by estimate (r) 0.252 C.R value of 2.617 and a significance value (*p*) of 0.009<005. Accordingly, the first hypothesis is accepted. These results reveal that the higher belief in knowledge is more likely to increase learner dependence on the environment. In a related context, these results suggest the possibility that the high level of belief in knowledge will more likely to increase students' interpersonal abilities and improve the capacity of participation in teams and involvement in problem solving.

The next hypothesis attempts to examine the effect of the variable of belief in knowledge on field-independence learning styles. The test results showed r = -0.964 and C.R value of -0.964 with a significance value (*p*) 0.335> 005. This means that the variable belief in knowledge has a negative and significant effect on field-independence learning styles. Thus, the second hypotsis is rejected. In the affirmative question model, by analyzing the influence of epistemic beliefs on learning styles chosen by students, negative and insignificant results from the variables of belief in knowledge of field-independence learning styles reinforced that

students with a high degree of belief in knowledge were more likely to have field-dependence learning styles as shown by the acceptance of first hypothesis.

The third test is to analyze the influence of belief in learning on field-dependence learning styles. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style, which is indicated by the value of C.R 2.542 and p value 0.011. Then, the third hypothesis is accepted. These results reveal that high belief in learning will tend to make students have a field-dependence learning style. In other words, students will be more intensive in interpersonal relationships and team involvement, compared to solely relying on themselves which is a special characteristic of field-independence learning styles in the learning process.

The next test examined the fourth hypothesis that belief in learning had a negative and significant influence on field-independence learning styles. The test results reveal the value of C.R -2.416 and a significance value of 0.016. These results demonstrate that students' belief in the importance of learning is negatively related to the likelihood of them choosing the field-dependence learning style. Thus, the fourth hypothesis is accepted. These results affirmatively also confirm the third hypothesis, expressing the tendency of students to become more actively involved in the team and other people, and consider environmental factors, as they increasingly believe in the importance of learning. This is because students are considered to have only one rational choice of the learning style, either field-independence or dependence field. This entire test confirms that students' high belief in the importance of knowledge and intensive learning will be proportionally related to their awareness to involve the environment, peers, and groups, to support the success of their studies.

Discussion

The results show that the belief in learning has a positive and significant effect on field-dependent learning style. Moreover, it also has a negative and significant influence on the field-independent learning style. The results are in accordance with Hashim et al. (2009) who conducted research on the relationship between personal epistemology and learning styles mediated by self-efficacy which the results showed that personal belief has a positive and direct effect on learning style. An empirical examination from Günes, et al. (2017) on epistemic views with learning styles in the preparatory program shows that pre-service teachers adopt philosophical skepticism and tends to favor an active learning style, and there is a significant relationship between learning styles and the pre-service teacher's epistemic outlook. The results of this study are also in accordance with Tümkaya (2012) conducted to 246 women and

242 men, a total of 488 students with the results showing that most students have learning styles of assimilation and converging. Moreover, there is no meaningful difference in the sub-dimension of beliefs about learning depends on effort in determining individual learning styles. On the other hand, it shows that in the sub-dimension of belief about learning depends on ability there is one unchanging assumption that is determined by diverging learning style.

From the results, this study highlights some noticeable findings regarding knowledge, learning style and epistemic beliefs. Knowledge is attributed as certain, absolute, unchanged, and not tentative. Students who have epistemic beliefs with field-dependent learning style tend to believe that knowledge is tentative and unpredictable, and does not believe that knowledge is fixed and immutable (Jehng et al., 1993). Furthermore, knowledge is believed to come from more knowledgeable or authority or expert with superior knowledge such as lecturers or reference books, compared to individual logic and thought. In this dimension, the student does not have a knowledge perspective, thus believing that the information from the reference book is true, and that the teacher must convey the material in the learning process (Jehng et al., 1993; Schommer, 1990). This is different for students who have more sophisticated epistemic beliefs with field-independent learning style, which emphasize more on the notion that knowledge comes from the constructs of their own thinking. According to Marchant (1992), students are inclined to accept what is delivered by the lecturer. Thus, this condition causes the individual to be very dependent on the environment and in learning to show field-independence. In terms of the orderly process as a contruct for epistemic belief, Jehng et al. (1993) explained that the dimensions of a regular process, or so-called rigid learning is the belief dimension of whether learning is a process that the individual passively receives the finished knowledge, or the process of formulating facts in which individuals independently build their ideas. In this dimension, the students' perspective prefers learning by taking the material exactly or in the same way as what they read in reference books and tend to follow what is written there from beginning to end (Jehng, et al., 1993).

Theoretically, the results of this study are insightful in understanding the influence of epistemic beliefs on knowledge and learning on learning styles that are very likely to be chosen by students. A high level of belief in learning and learning has a significant relationship with field-dependent learning styles. This implies that students are more likely to involve themselves in the team, discuss learning problems and tasks with partners and teachers, and have more interpersonal relationships with the surrounding context as a result of the increased belief in knowledge and learning. Furthermore, as a consequence of contingency logic, students with field-dependent learning styles are also more likely to reduce or negate the level of belief that

knowledge and learning can be obtained from their own abilities. Empirically, this is evidenced by the negative results and significant influence of beliefs on learning in field-independent learning styles. Practically, this study is useful for teachers and educators in designing learning models, where learning based on individual abilities such as reading and writing will make students more likely be field-independent learners, because of the lack of need for interaction with peers in learning activities. Furthermore, high student belief that academic abilities can only be achieved with the involvement of the surrounding environment will enable them to be active in groups. In this context, learning materials such as discussions and joint assignments will be able to encourage them to strive academically according to their epistemic beliefs.

CONCLUSION

This study aims to examine theoretical models of the influence of epistemic belief in the form of belief in knowledge and belief in learning to field-dependent learning style and field-independence. Statistical examination shows the positive and significant effect of exogenous variable in the form of variable of belief in knowledge on field-dependent learning style. However, this variable has no effect on field-independence learning style. In other side, the belief in learning had a significant positive effect on the field-dependent learning style and a negative and significant influence on the field-independent learning style. The result confirms that students believing that knowledge is absolute and certain will be more likely to adopt the belief that knowledge can only be obtained from people who are superiorly considered to know higher knowledge.

This research has been attempted to answer the problems posed by developing theoretical concepts which are then tested empirically. Although the findings of this study are promising, there are some limitations. The most noticeable is that although the SEM model shows that theoretical data is appropriate and accepted with empirical data, it is necessary to acknowledge that the overall purpose of this study is proven, namely the influence of the variable of belief on knowledge that has no effect on field independence learning styles. In addition, the sample involved only Early Childhood Education Study Program students whose 98.45 percent were female. The findings of this study henceforth may be possible gender bias.

In connection with the selection of limited research samples for undergraduate students, further research is expected to test the effect of epistemic beliefs on learning styles using the time-series method in a longitudinal design, to analyze more about the basis of the formation of epistemic beliefs and learning styles at each level of education, and their influence at the next level of education. Moreover, it is expected to analyze the factors that influence the

retention of this epistemic belief and and the possibility of fluctuations in the beliefs and changes in learning styles at certain levels of education.

Based on the results of this study it is suggested that educational institutions need to provide and enrich the development of epistemological beliefs in students in order to open opportunities for them to reflect not only on their learning style tendencies, but also about how and why certain learning styles are formed, and more specifically helps them to 'learn how to learn'.

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We have reached a decision regarding your submission to Jurnal Cakrawala Pendidikan, "EFFECT OF EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE".

We require you to revise your manuscript. Please see notes from the reviewer, and also the comments in the soft-copy of your article. You can download these from your dashboard account.

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Berdasarakan kondisi di atas, artikel masih perlu direvisi sesuai dengana saran. Tolong saran diikuti agar artikel tidak bolak-balik dikembalikan lagi.

EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE

M. Nur Ghufron[1]*, and Rini Risnawita Suminta[2]
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Abstract: Research in contemporary education over the past few decades has encouraged considering the influence of non-cognitive factors such as learning styles in various learning behaviors. This study aims to examine the influence of the epistemic beliefs that consist of belief in knowledge and belief in learning on the field-dependent and field-independent learning styles. The sample of this study consisted of 129 students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute through the simple random sampling technique. The data collection technique used in this study was a questionnair. There are three scales used in this study, namely epistemological trust scale, dependent learning style and independent learning style. Data were analyzed by using Structural Equation Modeling. The results show that the belief in learning has a significant and positive effect on the field-dependent and field-independent learning style. Meanwhile, the belief in learning has only a significant and negative effect on the field-independent learning style and has no significant effect on field-dependent learning style. The results provide some insightful considerations regarding the utilization of epistemic beliefs for improving learners' interaction with surrounding context to obtain optimal academic performance.

Keywords: epistemic beliefs, field-dependent, field-independent, learning style

KEPERCAYAAN EPISTEMOLOGIS TENTANG GAYA BELAJAR DEPENDEN DAN GAYA BELAJAR INDEPENDEN

Abstrak: Penelitian dalam pendidikan kontemporer selama beberapa dekade terakhir telah mendorong mempertimbangkan pengaruh faktor non-kognitif seperti gaya belajar dalam berbagai perilaku belajar. Penelitian ini bertujuan untuk menguji pengaruh kepercayaan epistemologis yang terdiri dari kepercayaan tentang pengetahuan dan kepercayaan tentang belajar pada gaya belajar dependen dan independen. Sampel penelitian ini terdiri dari 129 siswa program studi Pendidikan Islam Anak Usia Dini, Jurusan Tarbiyah Sekolah Tinggi Agama Islam Negeri Kudus melalui teknik simple random sampling. Teknik pengumpulan data yang digunakan dalam penelitian ini adalah kuesioner dalam bentuk skala yang diadopsi dari penelitian sebelumnya. Ada tiga skala yang digunakan dalam penelitian ini, yaitu skala kepercayaan epistemologis, gaya belajar dependen dan gaya belajar independen. Data dianalisis dengan menggunakan model *Structural Equation Modeling*. Hasil penelitian menunjukkan bahwa kepercayaan dalam belajar memiliki efek yang signifikan dan positif pada gaya belajar dependen dan independen. Sementara itu, kepercayaan tentang belajar hanya memiliki efek yang signifikan dan negatif pada gaya belajar independen, dan tidak memiliki efek signifikan pada gaya belajar dependen. Hasilnya memberikan beberapa pertimbangan mendalam tentang pemanfaatan kepercayaan epistemologis untuk meningkatkan interaksi peserta didik dengan konteks sekitarnya untuk mendapatkan kinerja akademik yang optimal.

Kata kunci: kepercayaan epistemologis, dependen, independen dan gaya belajar

INTRODUCTION

Various studies of psychology and education reveal that the learning style is considered not directly obtained by students from within themselves as it is highly related with cognitive, affective and psychological process (Felder & Silverman, 1988; Reid, 1987; Keefe, 1979; Mayer & Massa, 2003). It means that even though everyone has feelings, can develop his interests, and has the ability to think, everyone is different from other people's way of feeling, the way he develops his thoughts, the way he determines the development of his personal interests. Likewise, their tendency to choose a learning style obtained during the learning period will be profoundly affected by the learning process and the involvement of academic environment. In this context, students will relate to the external environment such as teachers, partners, and texts as references used in learning.

In addition, students' needs for the environment and their dependence on factors outside them will be strongly related to how they perceive the value of knowledge, the process of knowing, and the use of learning. This relates to the fact that the way a person processes and reacts to different needs that come from outside himself is different from how other people does it. Here, it should be noted that learning is not only solely related to the process at school, but also related to the extent to which students fundamentally believe the knowledge and learning (Muis, 2007; Bendixen, 2002).

Practically, understanding of knowledge will determine the extent to which students depend on the environment, learning style, and personal tendencies and orientation chosen for the success of the study. Students with an understanding that knowledge can be obtained by their own business are more likely to work individually and less dependent on others. Conversely, students with an understanding that knowledge can only be obtained from others or experts with higher knowledge authority will be more likely to be dependent on others and the environment. The first group is called field-independent learners which more tend to be actively involved in teams, work on group assignments and material discussion, and the second group is classified as field-dependent learners, which is is less dependent on teachers and peers, and more competitive in learning activities based on reading and writing (Kienhues, 2015). In short, field-dependent learners are less able to separate the context from the environment, while field-independent learners are better able to separate details from the context of the environment. In this view, they will have a high degree of involvement in the team, intensive interpersonal relationships, and participation in groups in the completion of tasks.

The extent to which students' understanding and belief in knowledge and learning and their effects on the choice of learning styles perceptions about academic achievements are more

likely to involve the environment (field-dependent), or focusing on themselves (field independent) has not received much attention from previous studies (e.g Campbell, Pungello, Miller-Johnson, Burchinal & Ramey, 2001; Higgins, Peterson, Pihl, & Lee, 2007; Rohde & Thompson, 2007).

In the last few decades, predictions of academic success are highly emphasized on cognitive factors such as intelligence and academic ability, although recently, researchers in the field of education and social sciences have realized that non-cognitive factors and skills play an important role in the success and achievement of education (McKenzie & Schweitzer, 2001; Bastian, Burns, & Nettelbeck, 2005; Nasim, Roberts, Harrell, & Young, 2005). It is strongly believed that non-cognitive skills factors are the same or even more important than the cognitive aspects of the education and work process (Khine, 2016).

Furthermore, previous research tends to be more interested in examining aspects of learning styles that are more concrete to be tested empirically, compared to examining the relationship between learning styles and epistemic beliefs (Franzoni, Assar, Defude, & Rojas, 2008; Komarraju, Karau, Schmeck, & Avdic, 2011; Hsieh, Jang, Hwang, & Chen,2011; Wong & Nunan, 2011). Here, it is assumed that student learning styles are the reflection of students' understanding and beliefs regarding knowledge and learning functions. This is related to the function of learning styles capable of explaining how individuals learn or how each person concentrates on the process, and masters difficult and new information through different perceptions. Style is personal characteristics for each person, and it serves to distinguish one person from another. Thus, in general the learning style is assumed to refer to the personalities, beliefs, choices, and behaviors used by individuals to assist in their learning in a conditioned situation.

Epistemic Beliefs and Learning Style

One important and decisive factor in exposing the use of learning strategies used by students is the students' epistemic beliefs. Huglin (2003) conducted research on personal epistemology with learning styles (feeler, thinker, sensor and intuiter) showed that these four learning styles differ significantly in terms of epistemic beliefs. Hashim, Ramly & Isaac (2009), exploring the relationship between personal epistemology and learning styles mediated by self-efficacy, found that personal belief has a direct and positive effect on learning style. Günes, Bati & Katranci (2017) shows that statistically, significant relationships were found between participants' learning styles and their epistemic outlook. The personality models of field-dependent - field-independent learning style are the derivation of learning style theory (Witkin,

Oltman, Raskin, & Karp, 1971). The individual considered as having a field-dependent learning style is when he perceives himself under the influence of the environment. Instead, the individual is considered to have a field-independent learning style when he perceives that most behaviors are not influenced by the environment.

Various studies have shown that epistemic beliefs influence the use of approaches in learning (Cano, 2005; Chan, 2003; 2004; Phan, 2006; Tsai & Chuang, 2005; Bra˚ten & Strømsø, 2005). Educational researchers such as Hofer & Pintrich (1997) claim that epistemic beliefs play an important role in academic behaviors, such as influencing the use of techniques in learning, for example, students who believe that the knowledge structure consists of cut-pieces that are not related to information, are likely to use memorization techniques as a learning technique and not an understanding technique. The study also concludes that students who see equally unchanging and stable knowledge tend to use memorization techniques of scientific facts. In contrast, learners who view knowledge as dynamic will prioritize aspects of information understanding (Davis, 1997). Moreover, students who believe that understanding technique is the best strategy in learning will have better results at the final exam than those who believe that memorizing techniques are the best (Davis, 1997).

Chan (2007) argues that learning behavior is strongly influenced by students' beliefs in the nature of their knowledge and abilities. For field-independent learners, they are not much influenced by authority, social and external figures outside of themselves and more guided by their own needs. Their dominant characteristics are closed nature (introvert), tendency to perform an activity on their own initiative to the best of their abilities (e.g., self-study) even without being motivated or persuaded by the people around them, working regularly and focusing and loving competition. Compared with a field-dependent personality, field-independent individuals have a lower social orientation, (Witkin et al., 1971). Witkin et al. (1971) also said that individuals with a field-independent learning style have a clear purpose and more freedom to learn.

This study attempts empirically to examine the effect of epistemic beliefs in the forms of belief in knowledge and belief in learning in the choice of learning styles from field-dependent or field-independent. Conceptually, this study adopts the logic theory of contingency, primarily the logic of contradiction, where it is assumed that students with high belief, either in knowledge or in learning, will only have a logical choice regarding the selection of learning styles of field-dependent or field-independent. This model is considered more likely to be able to offer empirical evidence that is more consequent to the learner's belief epistemic level.

METHODS

Research Design

This study seeks to examine the effect of epistemic beliefs on learning styles in students. Regarding the selection of respondents at the tertiary level, and not at the lower levels of the school, this study confirms to test the sustainability of the epistemic belief in learning styles. This is basically the selection of learning styles and beliefs in knowledge and knowing seems to have been formed during the previous education period.

Sampling

Population in this research is all students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute amounting to 252 students. The selection of students in the Early Childhood Islamic Education program is because these students become prospective teachers at the initial level of pre-school learning which forms the basis for the development o epistemological beliefs and learning styles for their students. The sampling technique in this study uses Proportional Random Sampling techniques by lottery. In random sampling each class in the population has the opportunity to be sampled. The proportion used to determine the number of samples in each class is 10% of the total number of students of the PIAUD study program. The number of samples obtained was 129 students. The sample distribution using Proportional Random Sampling in each batch can be seen in table 1 below:

Table 1. Distribution of samples

No	Semester (admission year)	Number of students	Female	Male	Sample
1	1 (2016)	52	52	0	26
2	3 (2015)	70	70	0	36
3	5 (2014)	64	62	2	33
4	7 (2013)	66	65	1	34
Total		**252**	**249**	**3**	**129**

Research Instruments

The method used to obtain data in this study is a questionnaire or questionnaire, a method based on self-report knowledge in personal beliefs. In this study there are three types of scales, namely the epistemological trust scale, the scale of dependent learning styles and the scale of independent learning styles. Epistemic belief in this research is divided into two components of belief, that are the belief in knowledge and belief in learning. The belief in

knowledge (BK) is the individual's belief in the nature of knowledge which includes aspects, such as; (1) knowledge comes from an expert/knowledge expert, (2) certain knowledge, and (3) orderly process.

Field-dependent learning style (FD) is a certain pattern that is stable when the individual accepts, interacts, absorbs, stores, organizes, and processes information with the individual's tendency to look at something globally, makes wide concept distinctions, shows social orientation and sets goals and reinforcement. This variable is expressed using the scale of the field-dependent learning style with the components as characterized by Witkin et al. (1971). Furthermore, individuals with a field-independent learning style (FI) have a tendency to look at things analytically, to make certain concepts distinct, to show an impersonal orientation and have their own designed goals. This variable is expressed using a field-independent learning style scale with components as characterized by Witkin et al. (1971). The example of item lattice for each variable can be seen in Table 2.

Table 2. Item Grids

Variable	Indicator	Example Item Grids
Belief about knowledge	Certain knowledge	I like classes where the lecturer sets the lecture program before teaching
	Omniscient	The answers in the reference book are helpful as I am not sure of my own solutions
	Simple knowledge	I feel comfortable when faced with uncertain learning conditions
Belief about learning	Innate ability	Students who have moderate achievement during high school will remain the same and have moderate achievements when they become students in Higher Education
	Quick learning	If I can not understand something quickly, I usually have difficulty in learning it as a whole".
Field dependent learning style	Viewing matters globally	I don't mind reading or listening without understanding each word as long as I can take the main idea
	Creating wide concept differences	When I study, I prefer simple and general material
	Showing social orientation	I enjoy studying together with friends
	Determine goals and improvements	I need a calm atmosphere in order to concentrate well

Field independent learning style	Viewing matters analytically	If I study, I understand the material in great detail (meticulously to the small things).
	Creating particular concept differences	I have to understand every word of what I hear and read
	Showing impersonal orientation	I like studying alone
	Possessing self designed goals	I finished my job as well as I could before I moved on to finish another task

Data Analysis Technique

The technique used to analyze data in this research was Structural Equation Models or also called Structural Equation Model. As for the needs of analysis, the software program Analysis of Moment Structures (AMOS) was used.

FINDINGS AND DISCUSSION

Findings

The age characteristics of respondents selected as samples of this study ranged from 18 to 26 years old. Almost all respondents were women. The majority of respondents aged between 18-20 years with a total of 91 people or 70.54%. In terms of the semester level, sampling is quite even at all levels of lecture (Table 3).

Table 3. Respondent Characteristics

Characteristics	**Frequency**	**(%)**
Gender:		
Female	127	98.45
Male	2	1.55
Age:		
18-20	91	70.54
21-25	24	18.60
>26	14	10.85

Descriptive statistics reveals the values of minimum, maximum, and mean and standard deviations for each question item. The mean value for each item ranged in the range of 2.33-3.05, indicating the medium tendency of the sample in the item in question (Table 4).

Table 4. Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev
Belief in Knowledge (BK)				
BK1	1	4	2.65	.669
BK2	1	4	2.71	.687
BK3	1	4	2.83	.601
Belief in Learning (BL)				
BL1	1	4	2.40	.701
BL2	1	3	2.33	.700
Field-Dependent (FD)				
FD1	1	4	2.81	.808
FD2	1	4	2.84	.755
FD3	1	4	2.52	.708
FD4	1	4	2.81	.751
Field-Independent (FI)				
FI1	1	4	2.34	.815
FI2	1	4	3.05	.759
FI3	1	4	2.78	.763
FI4	1	4	2.88	.725

Furthermore, to show how strong the influence between variables is, the correlation test with Pearson technique is done. Pearson correlation test results showed that out of 6 corelations, there were 3 significant correlational relationships between variables. Field-Dependent learning style (FD) is proven statistically to have negative and significant relation with Belief in Learning (BL) (FD-BL, -0.213, significant at 0.015). The results also show that the Field-Independent Learning variable has a positive and significant correlation in the two exogen constructs of Belief in Knowledge (FI-BL, 0.247; 0.005), and from belief in Learning (FI-BL, 0.320; 0.00) (Table 5).

Table 5. Correlation matrix of variables

Parameters	BK	BL	FD	FI
BK	1.00			
BL	.053 (.554)	1.00		
FD	-.088 (.320)	-.213* (.015)	1.00	
FI	.247** (.005)	.328** (.000)	.081 (.359)	1.00

**. Correlation is significant at the 0.01 level (2-tailed); *0.05 level (2-tailed).

Testing with SEM requires a confirmatory test as a means to validate the measurement model of latent constructs (Awang, 2012). the results of the validity test showed that all items had a standardized loading score above 0.7 as a validity standard. Therefore, all items are declared valid. Moreover, the results of the reliability calculation of the field-dependence learning style scale obtained a value of 0.71, while the field-independence learning style gained a reliability score of 0.74. The results of the reliability of belief in knowledge gained 0.91, while belief in learning gained a score of 0.81. Thus, the entire variables obtain good reliability scores above 0.70. Thus, all the variables used have met reliability requirements (Table 6).

Table 6. Standarized Loading and Reliability

Variable	**Loading Factor**	**Reliability**
Belief about Knowledge		0.*91*
Certain knowledge	0.81	
Omniscient	0.77	
Simple Knowledge	0.86	
Belief about Learning		0.*81*
Innate Ability	0.94	
Quick Learning	0.74	
Field Dependent Learning Style		0.*71*
Viewing Matters Globally	0.76	
Creating Wide Concept Differences	0.87	
Showing Social Orientation	0.63	
Determine Goals and Improvements	0.75	
Field independent Learning Style		0.*74*
Viewing Matters Analytically	0.93	
Creating Particular Concept Differences	0.88	

Showing Impersonal Orientation	0.77
Possessing Self Designed Goals	0.79

According to Ghozali (2008) and Setiyowati, Pali, Wiyono & Triyono, (2019), before the analysis of the model of structural equation as a whole is done, a unidimensionality test on each construct is done with confirmatory factor analysis. This unidimensionality test is conducted to determine whether the constructor measurement indicators have provided reliable results. Unidimensionality test of this research is done by seeing whether the grain discrimination power (total grain correlation) of construct indicator in this research is significant. The test is also done by looking at the convergent validity or loading factor value of each indicator. Confirmatory analysis is performed between exogenous variables and between indogenous variables. In this model, there are exogenous variables that are epistemic beliefs that consist of belief in knowledge and belief in learning. The indogenous variables consist of two kinds of learning style that is field-dependent and field-independent. The results of confirmatory analysis between exogenous and indogenous variables indicate that the value of fit criteria has been achieved well. Similarly, the significance value of standarized loading parameter estimation is all above 0.05, so it can be said fit. After several proposed conditions are met, the next step is to test the hypothesis of testing theoretical model data with the overall empirical data.

The results of of analysis of full model on stage 1 the initial structural model analysis showed that Chi-Square 76.527 (DF = 60. p = 0.074), CMIN/DF = 1.275, GFI = 0.918, AGFI = 0.875, TLI = 0.975 and RMSEA = 0.046. That the criteria of acceptance requirements of the model can be fulfilled. Based on the result of the significance analysis p = 0.074 and yet it will try to re-estimate to get better result again. The re-estimation of the model in this study through model modification. Of course modification of the model can still be done provided that the fit model was not found in accordance with empirical data, and as long as it does not deviate from the proposed theory. Modification of the model can be done by modifying the direction of the relationship between variables that already exist in the model, adding or reducing latent variables or observation variables as far as still in the frame of conceptual research support model.

As for model modification analysis in this study is to see the output on Modification Indices (MI) on AMOS 16 analysis that has been done. The output of Modification Indices recommends about the error variables that must be done further to be modified is to connect,

e1 with e7, e3 with e6 and e9 with e12. After that the retesting process is done, the results of this re-analysis show an improvement for the Goodness of Fit criteria (Figure 1).

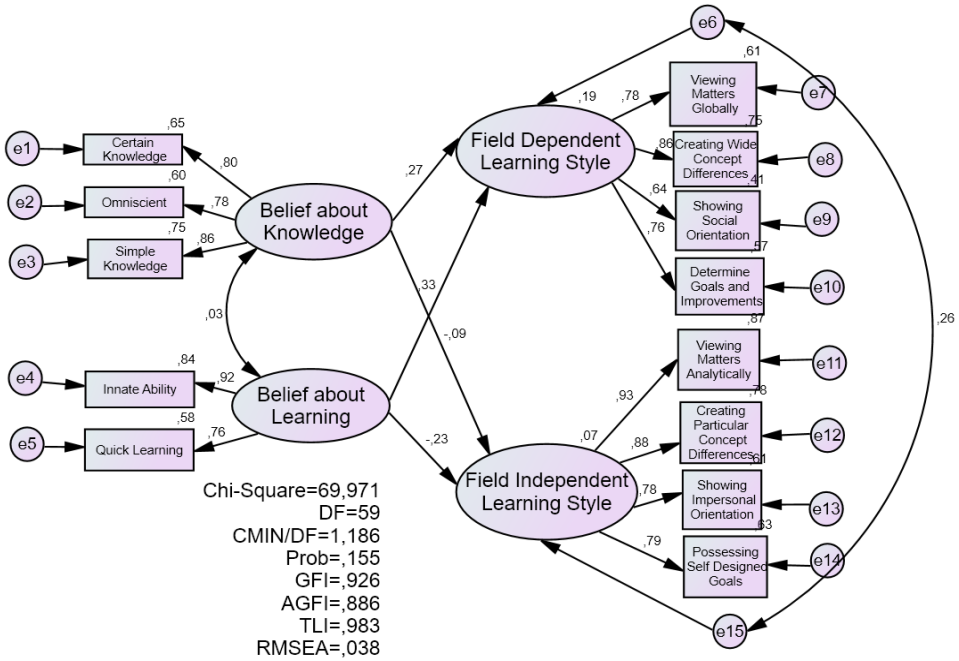

Figure 1. Results of the Modified Indices (MI) Analysis

Based on the retesting process it was found that the criterion requirement improved as the probability result from p = 0.074 to 0.155, the GFI value from 0.918 rose to 0.926, the AGFI from 0.875 to 0.886, the TLI from 0.975 to 0.983 and the RMSEA decreased from 0.046 to 0.038.

Thus, the relationship model undergoes improvement (figure 1). Thus, it can be stated that the proposed model design does not differ significantly from empirical data. Based on these results then the researchers no longer need to modify the model, so the model can be used in this study. This means the hypothesis that there is a corresponding theoretical model with empirical data is acceptable.

Hypothesis testing is based on the value of estimated loading which is the evaluation of regression weight between latent variables and degree of freedom (df), and he critical ratio (C.R) value or t-arithmetic with probability value (*p*) of 0.05 for the belief level of 95% (Table 7).

Table 7. Regression Weights of the Causality Test

Hypothesis	Sign	Estimate	S.E.	C.R.	*P*	Evaluation
FD ← BK	+ (<0.05)	0.252	0.96	2.617	0.009	Accepted
FI ← BK	- (<0.05)	-0.119	0.124	-0.964	0.335	Rejected

FD ← BL	+ (<0.05)	0.267	0.105	2.542	0.011	Accepted
FI ← BL	- (<0.05)	-0.259	0.107	-2.416	0.016	Accepted

Statistical test results show that the belief in knowledge has a positive and significant effect on the field-dependence learning styles, which is indicated by estimate (r) 0.252 C.R value of 2.617 and a significance value (*p*) of 0.009<005. Accordingly, the first hypothesis is accepted. These results reveal that the higher belief in knowledge is more likely to increase learner dependence on the environment. In a related context, these results suggest the possibility that the high level of belief in knowledge will more likely to increase students' interpersonal abilities and improve the capacity of participation in teams and involvement in problem solving.

The next hypothesis attempts to examine the effect of the variable of belief in knowledge on field-independence learning styles. The test results showed r = -0.964 and C.R value of -0.964 with a significance value (*p*) 0.335> 005. This means that the variable belief in knowledge has a negative effect on field-independence learning styles. Thus, the second hypotsis is rejected. In the affirmative question model, by analyzing the influence of epistemic beliefs on learning styles chosen by students, negative and insignificant results from the variables of belief in knowledge of field-independence learning styles reinforced that students with a high degree of belief in knowledge were more likely to have field-dependence learning styles as shown by the acceptance of first hypothesis.

The third test is to analyze the influence of belief in learning on field-dependence learning styles. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style, which is indicated by the value of C.R 2.542 and p value 0.011. Then, the third hypothesis is accepted. These results reveal that high belief in learning will tend to make students have a field-dependence learning style. In other words, students will be more intensive in interpersonal relationships and team involvement, compared to solely relying on themselves which is a special characteristic of field-independence learning styles in the learning process.

The next test examined the fourth hypothesis that belief in learning had a negative and significant influence on field-independence learning styles. The test results reveal the value of C.R -2.416 and a significance value of 0.016. These results demonstrate that students' belief in the importance of learning is negatively related to the likelihood of them choosing the field-dependence learning style. Thus, the fourth hypothesis is accepted. These results affirmatively also confirm the third hypothesis, expressing the tendency of students to become more actively

involved in the team and other people, and consider environmental factors, as they increasingly believe in the importance of learning. This is because students are considered to have only one rational choice of the learning style, either field-independence or dependence field. This entire test confirms that students' high belief in the importance of knowledge and intensive learning will be proportionally related to their awareness to involve the environment, peers, and groups, to support the success of their studies.

Discussion

The study showed empirical evidence that the proposed model design does not differ significantly from empirical data. This means the corresponding theoretical model with empirical data is acceptable. The belief in knowledge has a positive and significant effect on the field-dependence learning styles and the variable belief in knowledge has a negative effect on field-independence learning styles but rejected. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style. The belief in learning had a negative and significant influence on field-independence learning styles.

Setiap individu memiliki keunikan tersendiri dan tidak pernah ada dua orang yang memiliki pengalaman hidup yang sama persis, hampir dipastikan bahwa gaya belajar masing-masing orang berbeda satu dengan yang lain. Dua individu yang tumbuh dalam kondisi dan lingkungan yang sama dan meskipun mendapat perlakuan yang sama belum tentu akan memiliki pemahaman pemikiran dan pandangan yang sama terhadap dunia sekitarnya. Masing-masing memiliki cara pandang sendiri terhadap setiap peristiwa yang dilihat dan dialaminya. Gaya belajar mempunyai peranan penting dalam proses pendidikan.

According to Montgomery and Groat (1998), there are several reasons why learning styles need to be noticed in the teaching process. It refers to the process to make the learning process more dialogical, to understand students more differently by adjusting the knowledge base of the learner, the suitability of the task, the main areas, and the careers to suit the personality functions, talents, and to make the teaching process more appreciative of what students already have.

It is called individuals with field dependence learning styles when individuals perceive themselves to be controlled by the environment. As for individuals who have a field independence learning style is when individuals perceive themselves that most behaviors are not influenced by the environment. Some typical characteristics possessed by individuals with field dependence learning styles, are that these individuals have extroverted traits, tend to be motivated from the outside and much influenced by community groups or learning and

authority figures, experiencing more global events. (Witkin et al., 1971). Individuals with field dependence learning styles like the approach of an 'audience approach' when learning. As for individuals with field independence learning styles have an introverted nature, tend to be motivated from within or self (for example, self-study) and are less affected by social reinforcement, like competition, choose activities, and work structurally and Field-independent personalities have a social orientation lower, compared to field-dependent personalities. Individuals with field independence learning styles like learning that has clear goals and gives them more freedom of learning (Witkin et al., 1971).

Hofer & Pintrich (2002) menegaskan bahwa kepercayaan epistemologi berkaitan dengan kepribadian. Begitu pula Wood dan Kardash (2002) dan Wood, Kitchener, and Jensen (2002) juga mengatakan bahwa kepercayaan epistemologis berkaitan dengan komponen kepribadian, sementara gaya belajar merupakan bagian dari kepribadian. Menurut Garland (1993) berpendapat bahwa posisi kepercayaan epsitemologis menentukan perbedaan gaya belajar seperti gaya belajar analitic/serialis/field independent/left brained vs.global/holistic/field dependent/ right brained.

Hashim et al. (2009) who conducted research on the relationship between personal epistemology and learning styles mediated by self-efficacy which the results showed that personal belief has a positive and direct effect on learning style. An empirical examination from Günes, et al. (2017) on epistemic views with learning styles in the preparatory program shows that pre-service teachers adopt philosophical skepticism and tends to favor an active learning style, and there is a significant relationship between learning styles and the pre-service teacher's epistemic outlook. The results of this study are also in accordance with Tümkaya (2012) conducted to 246 women and 242 men, a total of 488 students with the results showing that most students have learning styles of assimilation and converging. Moreover, there is no meaningful difference in the sub-dimension of beliefs about learning depends on effort in determining individual learning styles. On the other hand, it shows that in the sub-dimension of belief about learning depends on ability there is one unchanging assumption that is determined by diverging learning style.

Understanding the role of belief in knowledge is important in assisting learners in using effective learning strategies to achieve academic goals. Bra˚ten and Strømsø (2005) find in students, who believe that knowledge is stable and can only be obtained through the teacher's authority, will be less goal-oriented and more oriented to memorizing. Students with low belief or even doubt in knowledge structures such as simple structured knowledge. They will have little or no intrinsic learning orientation, no respect for learning activities, no control over

learning and feeling that they can carry out a learning task. Similarly, students' beliefs in the stability of knowledge such as absolute, tentative or transient knowledge and students' beliefs in the source of knowledge that knowledge comes from a more knowledgeable person, from the experience of an authority to convey knowledge or derive from his own thoughts followed by various evidence.

From the results, this study highlights some noticeable findings regarding knowledge, learning style and epistemic beliefs. Knowledge is attributed as certain, absolute, unchanged, and not tentative. Students who have epistemic beliefs with field-dependent learning style tend to believe that knowledge is tentative and unpredictable, and does not believe that knowledge is fixed and immutable (Jehng et al., 1993). Furthermore, knowledge is believed to come from more knowledgeable or authority or expert with superior knowledge such as lecturers or reference books, compared to individual logic and thought. In this dimension, the student does not have a knowledge perspective, thus believing that the information from the reference book is true, and that the teacher must convey the material in the learning process (Jehng et al., 1993; Schommer, 1990; 1994).

This is different for students who have more sophisticated epistemic beliefs with field-independent learning style, which emphasize more on the notion that knowledge comes from the constructs of their own thinking. According to Marchant (1992), students are inclined to accept what is delivered by the lecturer. Thus, this condition causes the individual to be very dependent on the environment and in learning to show field-independence. In terms of the orderly process as a contruct for epistemic belief, Jehng et al. (1993) explained that the dimensions of a regular process, or so-called rigid learning is the belief dimension of whether learning is a process that the individual passively receives the finished knowledge, or the process of formulating facts in which individuals independently build their ideas. In this dimension, the students' perspective prefers learning by taking the material exactly or in the same way as what they read in reference books and tend to follow what is written there from beginning to end (Jehng, et al., 1993).

Theoretically, the results of this study are insightful in understanding the influence of epistemic beliefs on knowledge and learning on learning styles that are very likely to be chosen by students. A high level of belief in learning and learning has a significant relationship with field-dependent learning styles. This implies that students are more likely to involve themselves in the team, discuss learning problems and tasks with partners and teachers, and have more interpersonal relationships with the surrounding context as a result of the increased belief in knowledge and learning. Furthermore, as a consequence of contingency logic, students with

field-dependent learning styles are also more likely to reduce or negate the level of belief that knowledge and learning can be obtained from their own abilities.

Empirically, this is evidenced by the negative results and significant influence of beliefs on learning in field-independent learning styles. Practically, this study is useful for teachers and educators in designing learning models, where learning based on individual abilities such as reading and writing will make students more likely be field-independent learners, because of the lack of need for interaction with peers in learning activities. Furthermore, high student belief that academic abilities can only be achieved with the involvement of the surrounding environment will enable them to be active in groups. In this context, learning materials such as discussions and joint assignments will be able to encourage them to strive academically according to their epistemic beliefs.

CONCLUSION

Based on the results of the data analysis and discussion above, the conclusions that can be taken in this study are as follows. 1) That the proposed model design does not differ significantly from empirical data. This means the corresponding theoretical model with empirical data is acceptable. 2) Statistical examination shows the positive and significant effect of exogenous variable in the form of variable of belief in knowledge on field-dependent learning style. However, this variable has no effect on field-independence learning style. 3) The belief in learning had a significant positive effect on the field-dependent learning style and a negative and significant influence on the field-independent learning style. Based on the results of this study it is suggested that educational institutions need to provide and enrich the development of epistemological beliefs in students in order to open opportunities for them to reflect not only on their learning style tendencies, but also about how and why certain learning styles are formed, and more specifically helps them to 'learn how to learn'.

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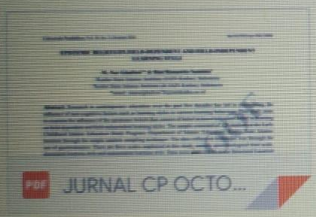

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EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE

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Abstract: Research in contemporary education over the past few decades has led to considering the influence of non-cognitive factors such as learning styles in various learning behaviors. This study aims to examine the influence of the epistemic beliefs that consist of belief in knowledge and belief in learning on field-dependent and field-independent learning styles. The sample consisted of 129 students at the Early Childhood Islamic Education Study Program, Department of Islamic Education, Kudus State Islamic Institute through the simple random sampling technique. The data collection technique was through the use of questionnaires. There are three scales employed in this study, namely epistemological trust scale, dependent learning style and independent learning style. Data were analyzed by using Structural Equation Modeling. The results show that the belief in learning has a significant and positive effect on the field-dependent and field-independent learning style. Meanwhile, the belief in learning has only a significant and negative effect on the field-independent learning style and has no significant effect on field-dependent learning style. The results provide some insightful considerations regarding the utilization of epistemic beliefs for improving learners' interaction with the surrounding context to obtain an optimal academic performance.

Keywords: Epistemic beliefs, field-dependent, field-independent, learning style

KEPERCAYAAN EPISTEMOLOGIS TENTANG GAYA BELAJAR DEPENDEN DAN GAYA BELAJAR INDEPENDEN

Abstrak: Penelitian dalam pendidikan kontemporer selama beberapa dekade terakhir telah mendorong mempertimbangkan pengaruh faktor non-kognitif seperti gaya belajar dalam berbagai perilaku belajar. Penelitian ini bertujuan untuk mendeskripsikan pengaruh kepercayaan epistemologis yang terdiri atas kepercayaan tentang pengetahuan dan belajar pada gaya belajar dependen dan independen. Sampel penelitian ini terdiri atas 129 siswa program studi Pendidikan Islam Anak Usia Dini, Jurusan Tarbiyah Sekolah Tinggi Agama Islam Negeri Kudus melalui teknik simple random sampling. Teknik pengumpulan data yang digunakan adalah kuesioner dalam bentuk skala yang diadopsi dari penelitian sebelumnya. Ada tiga skala yang digunakan dalam penelitian ini, yaitu skala kepercayaan epistemologis, gaya belajar dependen dan gaya belajar independen. Data dianalisis dengan menggunakan model Structural Equation Modeling. Hasil penelitian menunjukkan bahwa kepercayaan dalam belajar memiliki efek yang signifikan dan positif pada gaya belajar dependen dan independen. Sementara itu, kepercayaan tentang belajar hanya memiliki efek yang signifikan dan negatif pada gaya belajar independen, dan tidak memiliki efek signifikan pada gaya belajar dependen. Hasilnya memberikan beberapa pertimbangan mendalam tentang pemanfaatan kepercayaan epistemologis untuk meningkatkan interaksi peserta didik dengan konteks sekitarnya untuk mendapatkan kinerja akademik yang optimal.

Kata Kunci: Kepercayaan epistemologis, dependen, independen dan gaya belajar

INTRODUCTION

Various studies of psychology and education reveal that the learning style is considered not directly obtained by students from within themselves as it is highly related with cognitive, affective and psychological process (Felder & Silverman, 1988; Reid, 1987; Mayer & Massa, 2003). It means that even though

everyone has feelings, can develop his interests, and has the ability to think, everyone is different from other people's way of feeling, the way he develops his thoughts, the way he determines the development of his personal interests. Likewise, their tendency to choose a learning style obtained during the learning period will be profoundly affected by the learning process and the involvement of academic environment. In this context, students will relate to the external environment such as teachers, partners, and texts as references used in learning.

In addition, students' needs for the environment and their dependence on factors outside them will be strongly related to how they perceive the value of knowledge, the process of knowing, and the use of learning. This relates to the fact that the way a person processes and reacts to different needs that come from outside himself is different from how other people does it. Here, it should be noted that learning is not only solely related to the process at school, but also related to the extent to which students fundamentally believe the knowledge and learning (Muis, 2007; Bendixen, 2002).

Practically, understanding of knowledge will determine the extent to which students depend on the environment, learning style, and personal tendencies and orientation chosen for the success of the study. Students with an understanding that knowledge can be obtained by their own business are more likely to work individually and less dependent on others. Conversely, students with an understanding that knowledge can only be obtained from others or experts with higher knowledge authority will be more likely to be dependent on others and the environment. The first group is called field-independent learners which more tend to be actively involved in teams, work on group assignments and material discussion, and the second group is classified as field-dependent learners, which is is less dependent on teachers and peers, and more competitive in learning activities based on reading and writing (Kienhues, 2015). In short, field-dependent learners are less able to separate the context from the environment, while field-independent learners are better able to separate details from the context of the environment. In this view, they will have a high degree of involvement in the team, intensive interpersonal relationships, and participation in groups in the completion of tasks.

The extent to which students' understanding and belief in knowledge and learning and their effects on the choice of learning styles perceptions about academic achievements are more likely to involve the environment (field-dependent), or focusing on themselves (field independent) has not received much attention from previous studies (e.g Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Higgins, Peterson, Pihl, & Lee, 2007; Rohde & Thompson, 2007).

In the last few decades, predictions of academic success are highly emphasized on cognitive factors such as intelligence and academic ability, although recently, researchers in the field of education and social sciences have realized that non-cognitive factors and skills play an important role in the success and achievement of education (McKenzie & Schweitzer, 2001; Bastian, Burns, & Nettelbeck, 2005; Nasim, Roberts, Harrell, & Young, 2005). It is strongly believed that non-cognitive skills factors are the same or even more important than the cognitive aspects of the education and work process (Khine, 2016).

Furthermore, previous research tends to be more interested in examining aspects of learning styles that are more concrete to be tested empirically, compared to examining the relationship between learning styles and epistemic beliefs (Franzoni, Assar, Defude, & Rojas, 2008; Komarraju, Karau, Schmeck, & Avdic, 2011; Hsieh, Jang, Hwang, & Chen, 2011; Wong & Nunan, 2011). Here, it is assumed that student learning styles are the reflection of students' understanding and beliefs regarding knowledge and learning functions. This is related to the function of learning styles capable of explaining how individuals learn or how each person concentrates on the process, and masters difficult and new information through different perceptions. Style is personal characteristics for each person, and it serves to distinguish one person from another. Thus, in general the learning style is assumed to refer to the personalities, beliefs, choices, and behaviors used by individuals to assist in their learning in a conditioned situation.

Epistemic Beliefs and Learning Style

One important and decisive factor in exposing the use of learning strategies used by students is the students' epistemic beliefs. Huglin (2003) conducted research on personal epistemology with learning styles (feeler, thinker, sensor and intuiter) showed that these four learning styles differ significantly in terms of epistemic beliefs. Hashim, Ramly & Ishak (2009), exploring the relationship between personal epistemology and learning styles mediated by self-efficacy, found that personal belief has a direct and positive effect on learning style. Günes, Bati & Katranci (2017) shows that statistically, significant relationships were found between participants' learning styles and their epistemic outlook. The personality models of field-dependent - field-independent learning style are the derivation of learning style theory (Witkin, Oltman, Raskin, & Karp, 1971). The individual considered as having a field-dependent learning style is when he perceives himself under the influence of the environment. Instead, the individual is considered to have a field-independent learning style when he perceives that most behaviors are not influenced by the environment.

Various studies have shown that epistemic beliefs influence the use of approaches in learning (Cano, 2005; Phan, 2006; Tsai & Chuang, 2005; Bråten & Strømsø, 2005). Educational researchers such as Hofer & Pintrich (1997) claim that epistemic beliefs play an important role in academic behaviors, such as influencing the use of techniques in learning, for example, students who believe that the knowledge structure consists of cut- pieces that are not related to information, are likely to use memorization techniques as a learning technique and not an understanding technique. The study also concludes that students who see equally unchanging and stable knowledge tend to use memorization techniques of scientific facts. In contrast, learners who view knowledge as dynamic will prioritize aspects of information understanding (Davis, 1997). Moreover, students who believe that understanding technique is the best strategy in learning will have better results at the final exam than those who believe that memorizing techniques are the best (Davis, 1997).

Chan (2007) argues that learning behavior is strongly influenced by students' beliefs in the nature of their knowledge and abilities. For field-independent learners, they are not much influenced by authority, social and external figures outside of themselves and more guided by their own needs. Their dominant characteristics are closed nature (introvert), tendency to perform an activity on their own initiative to the best of their abilities (e.g., self-study) even without being motivated or persuaded by the people around them, working regularly and focusing and loving competition. Compared with a field-dependent personality, field-independent individuals have a lower social orientation, (Witkin *et al*., 1971). Witkin *et al*. (1971) also said that individuals with a field-independent learning style have a clear purpose and more freedom to learn.

This study attempts empirically to examine the effect of epistemic beliefs in the forms of belief in knowledge and belief in learning in the choice of learning styles from field-dependent or field-independent. Conceptually, this study adopts the logic theory of contingency, primarily the logic of contradiction, where it is assumed that students with high belief, either in knowledge or in learning, will only have a logical choice regarding the selection of learning styles of field-dependent or field-independent. This model is considered more likely to be able to offer empirical evidence that is more consequent to the learner's belief epistemic level.

METHODS

Research Design

This study seeks to examine the effect of epistemic beliefs on learning styles in students. Regarding the selection of respondents at the tertiary level, and not at the lower levels of the school, this study confirms to test the sustainability of the epistemic belief in learning styles. This is basically the selection of learning styles and beliefs in knowledge and knowing seems to have been formed during the previous education period.

Sampling

Population in this research is all students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute amounting to 252 students. The selection of students in the

Early Childhood Islamic Education program is because these students become prospective teachers at the initial level of pre-school learning which forms the basis for the development o epistemological beliefs and learning styles for their students. The sampling technique in this study uses Proportional Random Sampling techniques by lottery. In random sampling each class in the population has the opportunity to be sampled. The proportion used to determine the number of samples in each class is 10% of the total number of students of the PIAUD study program. The number of samples obtained was 129 students. The sample distribution using Proportional Random Sampling in each batch can be seen in Table 1.

Research Instruments

The method used to obtain data in this study is a questionnaire or questionnaire, a method based on self-report knowledge in personal beliefs. There are three types of scales, namely the epistemological trust scale, the scale of dependent learning styles and the scale of independent learning styles. Epistemic belief in this research is divided into two components of belief, that are the belief in knowledge and belief in learning. The belief in knowledge (BK) is the individual's belief in the nature of knowledge which includes aspects, such as; (1) knowledge comes from an expert/knowledge expert, (2) certain knowledge, and (3) orderly process.

Field-dependent learning style (FD) is a certain pattern that is stable when the individual accepts, interacts, absorbs, stores, organizes, and processes information with the individual's tendency to look at something globally, makes wide concept distinctions, shows social orientation and sets goals and reinforcement. This variable is expressed using the scale of the field-dependent learning style with the components as characterized by Witkin *et al*. (1971). Furthermore, individuals with a field-independent learning style (FI) have a tendency to look at things analytically, to make certain concepts distinct, to show an impersonal orientation and have their own designed goals. This variable is expressed using a field-independent learning style scale with components as characterized by Witkin *et al*. (1971). The example of item lattice for each variable can be seen in Table 2.

Data Analysis Technique

The technique used to analyze data in this research was Structural Equation Models or also called Structural Equation Model. As for the needs of analysis, the software program Analysis of Moment Structures (AMOS) was used.

FINDINGS AND DISCUSSION

Findings

The age characteristics of respondents selected as samples of this study ranged from 18 to 26 years old. Almost all respondents were women. The majority of respondents aged between 18-20 years with a total of 91 people or 70.54%. In terms of the semester level, sampling is quite even at all levels of lecture (Table 3).

Descriptive statistics reveals the values of minimum, maximum, and mean and standard deviations for each question item. The mean value for each item ranged in the range of 2.33-3.05, indicating the medium tendency of the sample in the item in question (Table 4).

Furthermore, to show how strong the influence between variables is, the correlation test with Pearson technique is done. Pearson correlation test results showed that out of 6 corelations, there were 3 significant correlational relationships between variables. Field-Dependent learning style (FD) is proven statistically to have negative and significant relation with belief in learning (BL) (FD-BL, -.213, significant at .015). The results also show that the Field-Independent Learning variable has a positive and significant correlation in the two exogen constructs of belief in knowledge (FI-BL, .247; .005), and from belief in Learning (FI-BL, .320; .00) (Table 5).

Testing with SEM requires a confirmatory test as a means to validate the measurement model of latent constructs (Awang, 2012). The results of the validity test showed that all items had a standardized loading score above .7 as a validity standard. Therefore, all items are declared valid. Moreover, the results of the reliability calculation of the FD learning style scale obtained a value of .71, while the FI learning style gained a reliability score of .74. The results of the reliability of BK gained .91, while BL gained a score of .81. Thus, the entire variables obtain good reliability scores above .70. Thus, all the variables used have met reliability requirements (Table 6).

Table 1. Distribution of Samples

No.	Semester (Admission Year)	Number of Students	Female	Male	Sample
1.	1 (2016)	52	52	0	26
2.	3 (2015)	70	70	0	36
3.	5 (2014)	64	62	2	33
4.	7 (2013)	66	65	1	34
Total		**252**	**249**	**3**	**129**

Table 2. Item Grids

Variable	Indicator	Example Item Grids
Belief about knowledge	Certain knowledge	I like classes where the lecturer sets the lecture program before teaching
	Omniscient	The answers in the reference book are helpful as I am not sure of my own solutions
	Simple knowledge	I feel comfortable when faced with uncertain learning conditions
Belief about learning	Innate ability	Students who have moderate achievement during high school will remain the same and have moderate achievements when they become students in Higher Education
	Quick learning	If I can not understand something quickly, I usually have difficulty in learning it as a whole
Field dependent learning style	Viewing matters globally	I don't mind reading or listening without understanding each word as long as I can take the main idea
	Creating wide concept differences	When I study, I prefer simple and general material
	Showing social orientation	I enjoy studying together with friends
	Determine goals and improvements	I need a calm atmosphere in order to concentrate well
Field independent learning style	Viewing matters analytically	If I study, I understand the material in great detail (meticulously to the small things).
	Creating particular concept differences	I have to understand every word of what I hear and read
	Showing impersonal orientation	I like studying alone
	Possessing self designed goals	I finished my job as well as I could before I moved on to finish another task

Table 3. Respondent Characteristics

Characteristics	Frequency	Percent	Remark
Gender			
Female	127	98.45	
Male	2	1.55	
Age			
18-20	91	70.54	
21-25	24	18.60	
>26	14	10.85	

Table 4. Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev
Belief in knowledge (BK)				
BK1	1	4	2.65	.669
BK2	1	4	2.71	.687
BK3	1	4	2.83	.601
Belief in learning (BL)				
BL1	1	4	2.40	.701
BL2	1	3	2.33	.700
Field-dependent (FD)				
FD1	1	4	2.81	.808
FD2	1	4	2.84	.755
FD3	1	4	2.52	.708
FD4	1	4	2.81	.751
Field-independent (FI)				
FI1	1	4	2.34	.815
FI2	1	4	3.05	.759
FI3	1	4	2.78	.763
FI4	1	4	2.88	.725

Table 5. Correlation Matrix of Variables

Parameters	BK	BL	FD	FI
BK	1.00			
BL	.053 (.554)	1.00		
FD	-.088 (.320)	-.213* (.015)	1.00	
FI	.247** (.005)	.328** (.000)	.081 (.359)	1.00

**. Correlation is significant at the .01 level (2-tailed); *.05 level (2-tailed).

Table 6. Standarized Loading and Reliability

Variable	Loading Factor	Reliability
Belief about knowledge		.91
Certain knowledge	.81	
Omniscient	.77	
Simple knowledge	.86	
Belief about learning		.81
Innate ability	.94	
Quick learning	.74	
Field dependent learning style		.71
Viewing matters globally	.76	
Creating wide concept differences	.87	
Showing social orientation	.63	
Determine goals and improvements	.75	
Field independent learning style		.74
Viewing matters analytically	.93	
Creating particular concept differences	.88	
Showing impersonal orientation	.77	
Possessing self designed goals	.79	

Ghozali (2008) and Setiyowati, Pali, Wiyono & Triyono (2019), before the analysis of the model of structural equation as a whole is done, a unidimensionality test on each construct is done with confirmatory factor analysis. This unidimensionality test is conducted to determine whether the constructor measurement indicators have provided reliable results. Unidimensionality test of this research is done by seeing whether the grain discrimination power (total grain correlation) of construct indicator in this research is significant. The test is also done by looking at the convergent validity or loading factor value of each indicator. Confirmatory analysis is performed between exogenous variables and between indogenous variables. In this model, there are exogenous variables that are epistemic beliefs that consist of belief in knowledge and belief in learning. The indogenous variables consist of two kinds of learning style that is field-dependent and field-independent. The results of confirmatory analysis between exogenous and indogenous variables indicate that the value of fit criteria has been achieved well. Similarly, the significance value of standarized loading parameter estimation is all above .05, so it can be said fit. After several proposed conditions are met, the next step is to test the hypothesis of testing theoretical model data with the overall empirical data.

The results of of analysis of full model on stage 1 the initial structural model analysis showed that Chi-Square 76.527 (DF = 60. p = .074), CMIN/DF = 1.275, GFI = .918, AGFI = .875, TLI = .975 and RMSEA = .046. That the criteria of acceptance requirements of the model can be fulfilled. Based on the result of the significance analysis p = .074 and yet it will try to re-estimate to get better result again. The re-estimation of the model in this study through model modification. Of course modification of the model can still be done provided that the fit model was not found in accordance with empirical data, and as long as it does not deviate from the proposed theory. Modification of the model can be done by modifying the direction of the relationship between variables that already exist in the model, adding or reducing latent variables or observation variables as far as still in the frame of conceptual research support model.

As for model modification analysis in this study is to see the output on Modification Indices (MI) on AMOS 16 analysis that has been done. The output of Modification Indices recommends about the error variables that must be done further to be modified is to connect, e1 with e7, e3 with e6 and e9 with e12. After that the retesting process is done, the results of this re-analysis show an improvement for the Goodness of Fit criteria (Figure 1).

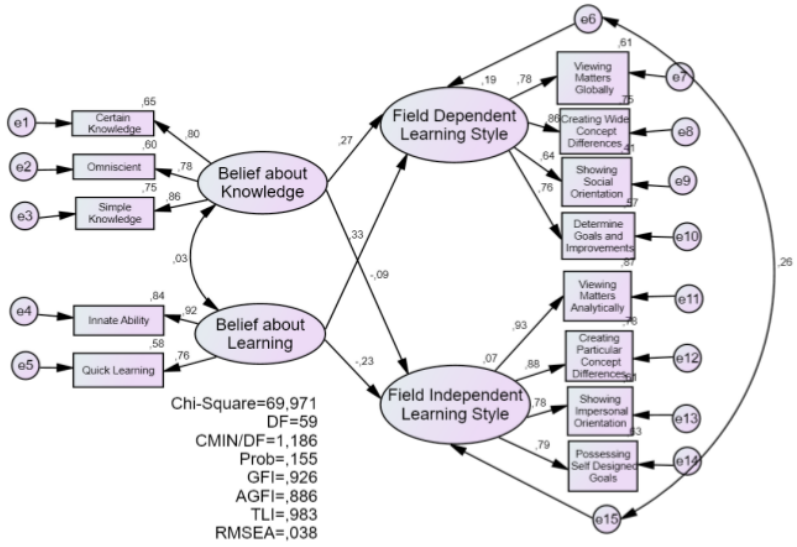

Figure 1. Results of the Modified Indices (MI) Analysis

Based on the retesting process it was found that the criterion requirement improved as the probability result from p = .074 to .155, the GFI value from .918 rose to .926, the AGFI from .875 to .886, the TLI from .975 to .983 and the RMSEA decreased from .046 to .038.

Thus, the relationship model undergoes improvement (Figure 1). Thus, it can be stated that the proposed model design does not differ significantly from empirical data. Based on these results then the researchers no longer need to modify the model, so the model can be used in this study. This means the hypothesis that there is a corresponding theoretical model with empirical data is acceptable.

Hypothesis testing is based on the value of estimated loading which is the evaluation of regression weight between latent variables and degree of freedom (*df*), and he critical ratio (C.R) value or t-arithmetic with probability value (*p*) of .05 for the belief level of 95% (Table 7).

Statistical test results show that the belief in knowledge has a positive and significant effect on the field-dependence learning styles, which is indicated by estimate (*r*) .252 C.R value of 2.617 and a significance value (*p*) of .009 < .05. Accordingly, the first hypothesis is accepted. These results reveal that the higher belief in knowledge is more likely to increase learner dependence on the environment. In a related context, these results suggest the possibility that the high level of belief in knowledge will more likely to increase students' interpersonal abilities and improve the capacity of participation in teams and involvement in problem solving.

The next hypothesis attempts to examine the effect of the variable of belief in knowledge on field-independence learning styles. The test results showed r = -.964 and C.R value of -.964 with a significance value (*p*) .335> .05. This means that the variable belief in knowledge has a negative effect on field-independence learning styles. Thus, the second hypotsis is rejected. In the affirmative question model, by analyzing the influence of epistemic beliefs on learning styles chosen by students, negative and insignificant results from the variables of belief in knowledge of field-independence learning styles reinforced that students with a high degree of belief in knowledge were more likely to have field-dependence learning styles as shown by the acceptance of first hypothesis.

The third test is to analyze the influence of belief in learning on field-dependence learning styles. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style, which is indicated by the value of C.R 2.542 and p value .011. Then, the third hypothesis is accepted. These results reveal that high belief in learning will tend to make students have a field-dependence learning style. In other words, students will be more intensive in interpersonal relationships and team involvement, compared to solely relying on themselves which is a special characteristic of field-independence learning styles in the learning process.

The next test examined the fourth hypothesis that belief in learning had a negative and significant influence on field-independence learning styles. The test results reveal the value of C.R -2.416 and a significance value of .016. These results demonstrate that students' belief in the importance of learning is negatively related to the likelihood of them choosing the field-dependence learning style. Thus, the fourth hypothesis is accepted. These results affirmatively also confirm the third hypothesis, expressing the tendency of students to become more actively involved in the team and other people, and consider environmental factors, as they increasingly believe in the importance of learning. This is because students are considered to have only one rational choice of the learning style, either field-independence or dependence field. This entire test confirms that students' high belief in the importance of knowledge and intensive learning will be proportionally related

Table 7. Regression Weights of the Causality Test

Hypothesis	Sign	Estimate	S.E.	C.R.	*P*	Evaluation
FD ← BK	+ (< .05)	.252	.96	2.617	.009	Accepted
FI BK	- (< .05)	-.119	.124	-.964	.335	Rejected
FD ← BL	+ (< .05)	.267	.105	2.542	.011	Accepted
FI ← BL	- (< .05)	-.259	.107	-2.416	.016	Accepted

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to their awareness to involve the environment, peers, and groups, to support the success of their studies.

Discussion

The study showed empirical evidence that the proposed model design does not differ significantly from empirical data. This means the corresponding theoretical model with empirical data is acceptable. The belief in knowledge has a positive and significant effect on the field-dependence learning styles and the variable belief in knowledge has a negative effect on field-independence learning styles but rejected. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style. The belief in learning had a negative and significant influence on field-independence learning styles.

Each individual has its own uniqueness and never two people have the exact same life experience, it is almost certain that the learning style of each person is different from one another. Two individuals who grow up in the same conditions and environment and even though they receive the same treatment will not necessarily have the same understanding of thoughts and views of the world around them. Each has his own perspective on every event he saw and experienced. Learning styles have an important role in the educational process.

Montgomery & Groat (1998) stated that there are several reasons why learning styles need to be noticed in the teaching process. It refers to the process to make the learning process more dialogical, to understand students more differently by adjusting the knowledge base of the learner, the suitability of the task, the main areas, and the careers to suit the personality functions, talents, and to make the teaching process more appreciative of what students already have.

It is called individuals with field dependence learning styles when individuals perceive themselves to be controlled by the environment. As for individuals who have a field independence learning style is when individuals perceive themselves that most behaviors are not influenced by the environment. Some typical characteristics possessed by individuals with field dependence learning styles, are that these individuals have extroverted traits, tend to be motivated from the outside and much influenced by community groups or learning and authority figures, experiencing more global events. (Witkin *et al*., 1971). Individuals with field dependence learning styles like the approach of an 'audience approach' when learning. As for individuals with field independence learning styles have an introverted nature, tend to be motivated from within or self (for example, self-study) and are less affected by social reinforcement, like competition, choose activities, and work structurally and Field-independent personalities have a social orientation lower, compared to field-dependent personalities. Individuals with field independence learning styles like learning that has clear goals and gives them more freedom of learning (Witkin *et al*., 1971).

Hofer (2002) assert that epistemological beliefs are related to personality. Likewise, Wood & Kardash (2002); Wood, Kitchener, & Jensen (2002) also say that epistemological beliefs are related to personality components, while learning styles are part of personality. According to Garland (1993), the position of epistemological belief determines differences in learning styles such as analytical / serial / field independent / left brained vs. global / holistic / field dependent / right brained learning styles.

Hashim *et al*. (2009) who conducted research on the relationship between personal epistemology and learning styles mediated by self-efficacy which the results showed that personal belief has a positive and direct effect on learning style. An empirical examination from Günes *et al*. (2017) on epistemic views with learning styles in the preparatory program shows that pre-service teachers adopt philosophical skepticism and tends to favor an active learning style, and there is a significant relationship between learning styles and the pre-service teacher's epistemic outlook. The results of this study are also in accordance with Tümkaya (2012) conducted to 246 women and 242 men, a total of 488 students with the results showing that most students have learning styles of assimilation and converging. Moreover, there is no meaningful difference in the sub-dimension of beliefs about learning depends on effort in determining individual learning styles. On the other hand, it shows that in the sub-dimension of belief about learning depends on ability there is one unchanging assumption that is determined by diverging learning style.

Understanding the role of belief in knowledge is important in assisting learners in using effective learning strategies to achieve academic goals. Bråten & Strømsø (2005) find in students, who believe that knowledge is stable and can only be obtained through the teacher's authority, will be less goal-oriented and more oriented to memorizing. Students with low belief or even doubt in knowledge structures such as simple structured knowledge. They will have little or no intrinsic learning orientation, no respect for learning activities, no control over learning and feeling that they can carry out a learning task. Similarly, students' beliefs in the stability of knowledge such as absolute, tentative or transient knowledge and students' beliefs in the source of knowledge that knowledge comes from a more knowledgeable person, from the experience of an authority to convey knowledge or derive from his own thoughts followed by various evidence.

From the results, this study highlights some noticeable findings regarding knowledge, learning style and epistemic beliefs. Knowledge is attributed as certain, absolute, unchanged, and not tentative. Students who have epistemic beliefs with field-dependent learning style tend to believe that knowledge is tentative and unpredictable, and does not believe that knowledge is fixed and immutable (Jehng, Johnson, & Anderson, 1993). Furthermore, knowledge is believed to come from more knowledgeable or authority or expert with superior knowledge such as lecturers or reference books, compared to individual logic and thought. In this dimension, the student does not have a knowledge perspective, thus believing that the information from the reference book is true, and that the teacher must convey the material in the learning process (Jehng *et al*., 1993; Schommer, 1990; 1994).

This is different for students who have more sophisticated epistemic beliefs with field-independent learning style, which emphasize more on the notion that knowledge comes from the constructs of their own thinking. According to Marchant (1992), students are inclined to accept what is delivered by the lecturer. Thus, this condition causes the individual to be very dependent on the environment and in learning to show field-independence. In terms of the orderly process as a contruct for epistemic belief, Jehng *et al*. (1993) explained that the dimensions of a regular process, or so-called rigid learning is the belief dimension of whether learning is a process that the individual passively receives the finished knowledge, or the process of formulating facts in which individuals independently build their ideas. In this dimension, the students' perspective prefers learning by taking the material exactly or in the same way as what they read in reference books and tend to follow what is written there from beginning to end (Jehng *et al*., 1993).

Theoretically, the results of this study are insightful in understanding the influence of epistemic beliefs on knowledge and learning on learning styles that are very likely to be chosen by students. A high level of belief in learning and learning has a significant relationship with field-dependent learning styles. This implies that students are more likely to involve themselves in the team, discuss learning problems and tasks with partners and teachers, and have more interpersonal relationships with the surrounding context as a result of the increased belief in knowledge and learning. Furthermore, as a consequence of contingency logic, students with field-dependent learning styles are also more likely to reduce or negate the level of belief that knowledge and learning can be obtained from their own abilities.

Empirically, this is evidenced by the negative results and significant influence of beliefs on learning in field-independent learning styles. Practically, this study is useful for teachers and educators in designing learning models, where learning based on individual abilities such as reading and writing will make students more likely be field-independent learners, because of the lack of need for interaction with peers in learning activities. Furthermore, high student belief that academic abilities can only be achieved with the involvement of the surrounding environment will enable them to be active in groups. In this context, learning materials such as discussions and joint assignments will be able to encourage them to strive academically according to their epistemic beliefs.

CONCLUSION

Based on the results of the data analysis and discussion above, the conclusions that can be taken in this study are as follows. 1) That the proposed model design does not differ significantly from empirical data. This means the

corresponding theoretical model with empirical data is acceptable. 2) Statistical examination shows the positive and significant effect of exogenous variable in the form of variable of belief in knowledge on field-dependent learning style. However, this variable has no effect on field-independence learning style. 3) The belief in learning had a significant positive effect on the field-dependent learning style and a negative and significant influence on the field-independent learning style. Based on the results of this study it is suggested that educational institutions need to provide and enrich the development of epistemological beliefs in students in order to open opportunities for them to reflect not only on their learning style tendencies, but also about how and why certain learning styles are formed, and more specifically helps them to 'learn how to learn'.

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Epistemic beliefs

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EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE

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Abstract: Research in contemporary education over the past few decades has led to considering the influence of non-cognitive factors such as learning styles in various learning behaviors. This study aims to examine the influence of the epistemic beliefs that consist of belief in knowledge and belief in learning on field-dependent and field-independent learning styles. The sample consisted of 129 students at the Early Childhood Islamic Education Study Program, Department of Islamic Education, Kudus State Islamic Institute through the simple random sampling technique. The data collection technique was through the use of questionnaires. There are three scales employed in this study, namely epistemological trust scale, dependent learning style and independent learning style. Data were analyzed by using Structural Equation Modeling. The results show that the belief in learning has a significant and positive effect on the field-dependent and field-independent learning style. Meanwhile, the belief in learning has only a significant and negative effect on the field-independent learning style and has no significant effect on field-dependent learning style. The results provide some insightful considerations regarding the utilization of epistemic beliefs for improving learners' interaction with the surrounding context to obtain an optimal academic performance.

Keywords: Epistemic beliefs, field-dependent, field-independent, learning style

KEPERCAYAAN EPISTEMOLOGIS TENTANG GAYA BELAJAR DEPENDEN DAN GAYA BELAJAR INDEPENDEN

Abstrak: Penelitian dalam pendidikan kontemporer selama beberapa dekade terakhir telah mendorong mempertimbangkan pengaruh faktor non-kognitif seperti gaya belajar dalam berbagai perilaku belajar. Penelitian ini bertujuan untuk mendeskripsikan pengaruh kepercayaan epistemologis yang terdiri atas kepercayaan tentang pengetahuan dan belajar pada gaya belajar dependen dan independen. Sampel penelitian ini terdiri atas 129 siswa program studi Pendidikan Islam Anak Usia Dini, Jurusan Tarbiyah Sekolah Tinggi Agama Islam Negeri Kudus melalui teknik simple random sampling. Teknik pengumpulan data yang digunakan adalah kuesioner dalam bentuk skala yang diadopsi dari penelitian sebelumnya. Ada tiga skala yang digunakan dalam penelitian ini, yaitu skala kepercayaan epistemologis, gaya belajar dependen dan gaya belajar independen. Data dianalisis dengan menggunakan model Structural Equation Modeling. Hasil penelitian menunjukkan bahwa kepercayaan dalam belajar memiliki efek yang signifikan dan positif pada gaya belajar dependen dan independen. Sementara itu, kepercayaan tentang belajar hanya memiliki efek yang signifikan dan negatif pada gaya belajar independen, dan tidak memiliki efek signifikan pada gaya belajar dependen. Hasilnya memberikan beberapa pertimbangan mendalam tentang pemanfaatan kepercayaan epistemologis untuk meningkatkan interaksi peserta didik dengan konteks sekitarnya untuk mendapatkan kinerja akademik yang optimal.

Kata Kunci: Kepercayaan epistemologis, dependen, independen dan gaya belajar

INTRODUCTION

Various studies of psychology and education reveal that the learning style is considered not directly obtained by students from within themselves as it is highly related with cognitive, affective and psychological process (Felder & Silverman, 1988; Reid, 1987; Mayer & Massa, 2003). It means that even though

everyone has feelings, can develop his interests, and has the ability to think, everyone is different from other people's way of feeling, the way he develops his thoughts, the way he determines the development of his personal interests. Likewise, their tendency to choose a learning style obtained during the learning period will be profoundly affected by the learning process and the involvement of academic environment. In this context, students will relate to the external environment such as teachers, partners, and texts as references used in learning.

In addition, students' needs for the environment and their dependence on factors outside them will be strongly related to how they perceive the value of knowledge, the process of knowing, and the use of learning. This relates to the fact that the way a person processes and reacts to different needs that come from outside himself is different from how other people does it. Here, it should be noted that learning is not only solely related to the process at school, but also related to the extent to which students fundamentally believe the knowledge and learning (Muis, 2007; Bendixen, 2002).

Practically, understanding of knowledge will determine the extent to which students depend on the environment, learning style, and personal tendencies and orientation chosen for the success of the study. Students with an understanding that knowledge can be obtained by their own business are more likely to work individually and less dependent on others. Conversely, students with an understanding that knowledge can only be obtained from others or experts with higher knowledge authority will be more likely to be dependent on others and the environment. The first group is called field-independent learners which more tend to be actively involved in teams, work on group assignments and material discussion, and the second group is classified as field-dependent learners, which is is less dependent on teachers and peers, and more competitive in learning activities based on reading and writing (Kienhues, 2015). In short, field-dependent learners are less able to separate the context from the environment, while field-independent learners are better able to separate details from the context of the environment. In this view, they will have a high degree of involvement in the team, intensive interpersonal relationships, and participation in groups in the completion of tasks.

The extent to which students' understanding and belief in knowledge and learning and their effects on the choice of learning styles perceptions about academic achievements are more likely to involve the environment (field-dependent), or focusing on themselves (field independent) has not received much attention from previous studies (e.g Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Higgins, Peterson, Pihl, & Lee, 2007; Rohde & Thompson, 2007).

In the last few decades, predictions of academic success are highly emphasized on cognitive factors such as intelligence and academic ability, although recently, researchers in the field of education and social sciences have realized that non-cognitive factors and skills play an important role in the success and achievement of education (McKenzie & Schweitzer, 2001; Bastian, Burns, & Nettelbeck, 2005; Nasim, Roberts, Harrell, & Young, 2005). It is strongly believed that non-cognitive skills factors are the same or even more important than the cognitive aspects of the education and work process (Khine, 2016).

Furthermore, previous research tends to be more interested in examining aspects of learning styles that are more concrete to be tested empirically, compared to examining the relationship between learning styles and epistemic beliefs (Franzoni, Assar, Defude, & Rojas, 2008; Komarraju, Karau, Schmeck, & Avdic, 2011; Hsieh, Jang, Hwang, & Chen, 2011; Wong & Nunan, 2011). Here, it is assumed that student learning styles are the reflection of students' understanding and beliefs regarding knowledge and learning functions. This is related to the function of learning styles capable of explaining how individuals learn or how each person concentrates on the process, and masters difficult and new information through different perceptions. Style is personal characteristics for each person, and it serves to distinguish one person from another. Thus, in general the learning style is assumed to refer to the personalities, beliefs, choices, and behaviors used by individuals to assist in their learning in a conditioned situation.

Epistemic Beliefs and Learning Style

One important and decisive factor in exposing the use of learning strategies used by students is the students' epistemic beliefs. Huglin (2003) conducted research on personal epistemology with learning styles (feeler, thinker, sensor and intuiter) showed that these four learning styles differ significantly in terms of epistemic beliefs. Hashim, Ramly & Ishak (2009), exploring the relationship between personal epistemology and learning styles mediated by self-efficacy, found that personal belief has a direct and positive effect on learning style. Günes, Bati & Katranci (2017) shows that statistically, significant relationships were found between participants' learning styles and their epistemic outlook. The personality models of field-dependent - field-independent learning style are the derivation of learning style theory (Witkin, Oltman, Raskin, & Karp, 1971). The individual considered as having a field-dependent learning style is when he perceives himself under the influence of the environment. Instead, the individual is considered to have a field-independent learning style when he perceives that most behaviors are not influenced by the environment.

Various studies have shown that epistemic beliefs influence the use of approaches in learning (Cano, 2005; Phan, 2006; Tsai & Chuang, 2005; Bråten & Strømsø, 2005). Educational researchers such as Hofer & Pintrich (1997) claim that epistemic beliefs play an important role in academic behaviors, such as influencing the use of techniques in learning, for example, students who believe that the knowledge structure consists of cut- pieces that are not related to information, are likely to use memorization techniques as a learning technique and not an understanding technique. The study also concludes that students who see equally unchanging and stable knowledge tend to use memorization techniques of scientific facts. In contrast, learners who view knowledge as dynamic will prioritize aspects of information understanding (Davis, 1997). Moreover, students who believe that understanding technique is the best strategy in learning will have better results at the final exam than those who believe that memorizing techniques are the best (Davis, 1997).

Chan (2007) argues that learning behavior is strongly influenced by students' beliefs in the nature of their knowledge and abilities. For field-independent learners, they are not much influenced by authority, social and external figures outside of themselves and more guided by their own needs. Their dominant characteristics are closed nature (introvert), tendency to perform an activity on their own initiative to the best of their abilities (e.g., self-study) even without being motivated or persuaded by the people around them, working regularly and focusing and loving competition. Compared with a field-dependent personality, field-independent individuals have a lower social orientation, (Witkin *et al*., 1971). Witkin *et al*. (1971) also said that individuals with a field-independent learning style have a clear purpose and more freedom to learn.

This study attempts empirically to examine the effect of epistemic beliefs in the forms of belief in knowledge and belief in learning in the choice of learning styles from field-dependent or field-independent. Conceptually, this study adopts the logic theory of contingency, primarily the logic of contradiction, where it is assumed that students with high belief, either in knowledge or in learning, will only have a logical choice regarding the selection of learning styles of field-dependent or field-independent. This model is considered more likely to be able to offer empirical evidence that is more consequent to the learner's belief epistemic level.

METHODS

Research Design

This study seeks to examine the effect of epistemic beliefs on learning styles in students. Regarding the selection of respondents at the tertiary level, and not at the lower levels of the school, this study confirms to test the sustainability of the epistemic belief in learning styles. This is basically the selection of learning styles and beliefs in knowledge and knowing seems to have been formed during the previous education period.

Sampling

Population in this research is all students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute amounting to 252 students. The selection of students in the

Early Childhood Islamic Education program is because these students become prospective teachers at the initial level of pre-school learning which forms the basis for the development o epistemological beliefs and learning styles for their students. The sampling technique in this study uses Proportional Random Sampling techniques by lottery. In random sampling each class in the population has the opportunity to be sampled. The proportion used to determine the number of samples in each class is 10% of the total number of students of the PIAUD study program. The number of samples obtained was 129 students. The sample distribution using Proportional Random Sampling in each batch can be seen in Table 1.

Research Instruments

The method used to obtain data in this study is a questionnaire or questionnaire, a method based on self-report knowledge in personal beliefs. There are three types of scales, namely the epistemological trust scale, the scale of dependent learning styles and the scale of independent learning styles. Epistemic belief in this research is divided into two components of belief, that are the belief in knowledge and belief in learning. The belief in knowledge (BK) is the individual's belief in the nature of knowledge which includes aspects, such as; (1) knowledge comes from an expert/knowledge expert, (2) certain knowledge, and (3) orderly process.

Field-dependent learning style (FD) is a certain pattern that is stable when the individual accepts, interacts, absorbs, stores, organizes, and processes information with the individual's tendency to look at something globally, makes wide concept distinctions, shows social orientation and sets goals and reinforcement. This variable is expressed using the scale of the field-dependent learning style with the components as characterized by Witkin *et al*. (1971). Furthermore, individuals with a field-independent learning style (FI) have a tendency to look at things analytically, to make certain concepts distinct, to show an impersonal orientation and have their own designed goals. This variable is expressed using a field-independent learning style scale with components as characterized by Witkin *et al*. (1971). The example of item lattice for each variable can be seen in Table 2.

Data Analysis Technique

The technique used to analyze data in this research was Structural Equation Models or also called Structural Equation Model. As for the needs of analysis, the software program Analysis of Moment Structures (AMOS) was used.

FINDINGS AND DISCUSSION

Findings

The age characteristics of respondents selected as samples of this study ranged from 18 to 26 years old. Almost all respondents were women. The majority of respondents aged between 18-20 years with a total of 91 people or 70.54%. In terms of the semester level, sampling is quite even at all levels of lecture (Table 3).

Descriptive statistics reveals the values of minimum, maximum, and mean and standard deviations for each question item. The mean value for each item ranged in the range of 2.33-3.05, indicating the medium tendency of the sample in the item in question (Table 4).

Furthermore, to show how strong the influence between variables is, the correlation test with Pearson technique is done. Pearson correlation test results showed that out of 6 corelations, there were 3 significant correlational relationships between variables. Field-Dependent learning style (FD) is proven statistically to have negative and significant relation with belief in learning (BL) (FD-BL, -.213, significant at .015). The results also show that the Field-Independent Learning variable has a positive and significant correlation in the two exogen constructs of belief in knowledge (FI-BL, .247; .005), and from belief in Learning (FI-BL, .320; .00) (Table 5).

Testing with SEM requires a confirmatory test as a means to validate the measurement model of latent constructs (Awang, 2012). The results of the validity test showed that all items had a standardized loading score above .7 as a validity standard. Therefore, all items are declared valid. Moreover, the results of the reliability calculation of the FD learning style scale obtained a value of .71, while the FI learning style gained a reliability score of .74. The results of the reliability of BK gained .91, while BL gained a score of .81. Thus, the entire variables obtain good reliability scores above .70. Thus, all the variables used have met reliability requirements (Table 6).

Table 1. Distribution of Samples

No.	Semester (Admission Year)	Number of Students	Female	Male	Sample
1.	1 (2016)	52	52	0	26
2.	3 (2015)	70	70	0	36
3.	5 (2014)	64	62	2	33
4.	7 (2013)	66	65	1	34
Total		**252**	**249**	**3**	**129**

Table 2. Item Grids

Variable	Indicator	Example Item Grids
Belief about knowledge	Certain knowledge	I like classes where the lecturer sets the lecture program before teaching
	Omniscient	The answers in the reference book are helpful as I am not sure of my own solutions
	Simple knowledge	I feel comfortable when faced with uncertain learning conditions
Belief about learning	Innate ability	Students who have moderate achievement during high school will remain the same and have moderate achievements when they become students in Higher Education
	Quick learning	If I can not understand something quickly, I usually have difficulty in learning it as a whole
Field dependent learning style	Viewing matters globally	I don't mind reading or listening without understanding each word as long as I can take the main idea
	Creating wide concept differences	When I study, I prefer simple and general material
	Showing social orientation	I enjoy studying together with friends
	Determine goals and improvements	I need a calm atmosphere in order to concentrate well
Field independent learning style	Viewing matters analytically	If I study, I understand the material in great detail (meticulously to the small things).
	Creating particular concept differences	I have to understand every word of what I hear and read
	Showing impersonal orientation	I like studying alone
	Possessing self designed goals	I finished my job as well as I could before I moved on to finish another task

Table 3. Respondent Characteristics

Characteristics	Frequency	Percent	Remark
Gender			
Female	127	98.45	
Male	2	1.55	
Age			
18-20	91	70.54	
21-25	24	18.60	
>26	14	10.85	

Table 4. Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev
Belief in knowledge (BK)				
BK1	1	4	2.65	.669
BK2	1	4	2.71	.687
BK3	1	4	2.83	.601
Belief in learning (BL)				
BL1	1	4	2.40	.701
BL2	1	3	2.33	.700
Field-dependent (FD)				
FD1	1	4	2.81	.808
FD2	1	4	2.84	.755
FD3	1	4	2.52	.708
FD4	1	4	2.81	.751
Field-independent (FI)				
FI1	1	4	2.34	.815
FI2	1	4	3.05	.759
FI3	1	4	2.78	.763
FI4	1	4	2.88	.725

Table 5. Correlation Matrix of Variables

Parameters	BK	BL	FD	FI
BK	1.00			
BL	.053 (.554)	1.00		
FD	-.088 (.320)	-.213* (.015)	1.00	
FI	.247** (.005)	.328** (.000)	.081 (.359)	1.00

**. Correlation is significant at the .01 level (2-tailed); *.05 level (2-tailed).

Table 6. Standarized Loading and Reliability

Variable	Loading Factor	Reliability
Belief about knowledge		.91
Certain knowledge	.81	
Omniscient	.77	
Simple knowledge	.86	
Belief about learning		.81
Innate ability	.94	
Quick learning	.74	
Field dependent learning style		.71
Viewing matters globally	.76	
Creating wide concept differences	.87	
Showing social orientation	.63	
Determine goals and improvements	.75	
Field independent learning style		.74
Viewing matters analytically	.93	
Creating particular concept differences	.88	
Showing impersonal orientation	.77	
Possessing self designed goals	.79	

Ghozali (2008) and Setiyowati, Pali, Wiyono & Triyono (2019), before the analysis of the model of structural equation as a whole is done, a unidimensionality test on each construct is done with confirmatory factor analysis. This unidimensionality test is conducted to determine whether the constructor measurement indicators have provided reliable results. Unidimensionality test of this research is done by seeing whether the grain discrimination power (total grain correlation) of construct indicator in this research is significant. The test is also done by looking at the convergent validity or loading factor value of each indicator. Confirmatory analysis is performed between exogenous variables and between indogenous variables. In this model, there are exogenous variables that are epistemic beliefs that consist of belief in knowledge and belief in learning. The indogenous variables consist of two kinds of learning style that is field-dependent and field-independent. The results of confirmatory analysis between exogenous and indogenous variables indicate that the value of fit criteria has been achieved well. Similarly, the significance value of standarized loading parameter estimation is all above .05, so it can be said fit. After several proposed conditions are met, the next step is to test the hypothesis of testing theoretical model data with the overall empirical data.

The results of of analysis of full model on stage 1 the initial structural model analysis showed that Chi-Square 76.527 (DF = 60. p = .074), CMIN/DF = 1.275, GFI = .918, AGFI = .875, TLI = .975 and RMSEA = .046. That the criteria of acceptance requirements of the model can be fulfilled. Based on the result of the significance analysis p = .074 and yet it will try to re-estimate to get better result again. The re-estimation of the model in this study through model modification. Of course modification of the model can still be done provided that the fit model was not found in accordance with empirical data, and as long as it does not deviate from the proposed theory. Modification of the model can be done by modifying the direction of the relationship between variables that already exist in the model, adding or reducing latent variables or observation variables as far as still in the frame of conceptual research support model.

As for model modification analysis in this study is to see the output on Modification Indices (MI) on AMOS 16 analysis that has been done. The output of Modification Indices recommends about the error variables that must be done further to be modified is to connect, e1 with e7, e3 with e6 and e9 with e12. After that the retesting process is done, the results of this re-analysis show an improvement for the Goodness of Fit criteria (Figure 1).

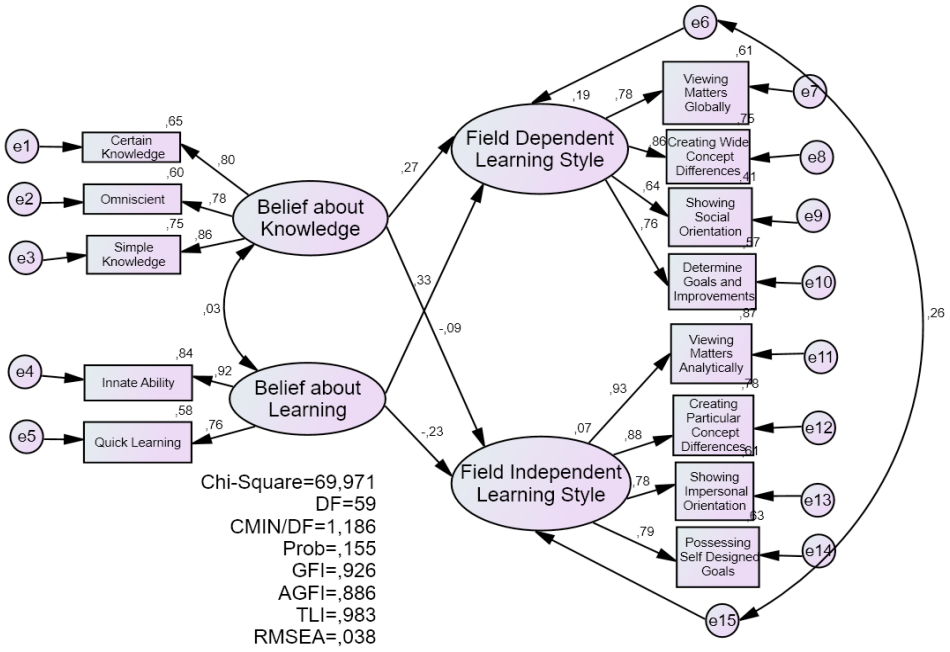

Figure 1. Results of the Modified Indices (MI) Analysis

Based on the retesting process it was found that the criterion requirement improved as the probability result from p = .074 to .155, the GFI value from .918 rose to .926, the AGFI from .875 to .886, the TLI from .975 to .983 and the RMSEA decreased from .046 to .038.

Thus, the relationship model undergoes improvement (Figure 1). Thus, it can be stated that the proposed model design does not differ significantly from empirical data. Based on these results then the researchers no longer need to modify the model, so the model can be used in this study. This means the hypothesis that there is a corresponding theoretical model with empirical data is acceptable.

Hypothesis testing is based on the value of estimated loading which is the evaluation of regression weight between latent variables and degree of freedom (*df*), and he critical ratio (C.R) value or t-arithmetic with probability value (*p*) of .05 for the belief level of 95% (Table 7).

Statistical test results show that the belief in knowledge has a positive and significant effect on the field-dependence learning styles, which is indicated by estimate (*r*) .252 C.R value of 2.617 and a significance value (*p*) of .009 < .05. Accordingly, the first hypothesis is accepted. These results reveal that the higher belief in knowledge is more likely to increase learner dependence on the environment. In a related context, these results suggest the possibility that the high level of belief in knowledge will more likely to increase students' interpersonal abilities and improve the capacity of participation in teams and involvement in problem solving.

The next hypothesis attempts to examine the effect of the variable of belief in knowledge on field-independence learning styles. The test results showed r = -.964 and C.R value of -.964 with a significance value (*p*) .335> .05. This means that the variable belief in knowledge has a negative effect on field-independence learning styles. Thus, the second hypotsis is rejected. In the affirmative question model, by analyzing the influence of epistemic beliefs on learning styles chosen by students, negative and insignificant results from the variables of belief in knowledge of field-independence learning styles reinforced that students with a high degree of belief in knowledge were more likely to have field-dependence learning styles as shown by the acceptance of first hypothesis.

The third test is to analyze the influence of belief in learning on field-dependence learning styles. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style, which is indicated by the value of C.R 2.542 and p value .011. Then, the third hypothesis is accepted. These results reveal that high belief in learning will tend to make students have a field-dependence learning style. In other words, students will be more intensive in interpersonal relationships and team involvement, compared to solely relying on themselves which is a special characteristic of field-independence learning styles in the learning process.

The next test examined the fourth hypothesis that belief in learning had a negative and significant influence on field-independence learning styles. The test results reveal the value of C.R -2.416 and a significance value of .016. These results demonstrate that students' belief in the importance of learning is negatively related to the likelihood of them choosing the field-dependence learning style. Thus, the fourth hypothesis is accepted. These results affirmatively also confirm the third hypothesis, expressing the tendency of students to become more actively involved in the team and other people, and consider environmental factors, as they increasingly believe in the importance of learning. This is because students are considered to have only one rational choice of the learning style, either field-independence or dependence field. This entire test confirms that students' high belief in the importance of knowledge and intensive learning will be proportionally related

Table 7. Regression Weights of the Causality Test

Hypothesis	Sign	Estimate	S.E.	C.R.	*P*	Evaluation
FD ← BK	+ (< .05)	.252	.96	2.617	.009	Accepted
FI BK	- (< .05)	-.119	.124	-.964	.335	Rejected
FD ← BL	+ (< .05)	.267	.105	2.542	.011	Accepted
FI ← BL	- (< .05)	-.259	.107	-2.416	.016	Accepted

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to their awareness to involve the environment, peers, and groups, to support the success of their studies.

Discussion

The study showed empirical evidence that the proposed model design does not differ significantly from empirical data. This means the corresponding theoretical model with empirical data is acceptable. The belief in knowledge has a positive and significant effect on the field-dependence learning styles and the variable belief in knowledge has a negative effect on field-independence learning styles but rejected. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style. The belief in learning had a negative and significant influence on field-independence learning styles.

Each individual has its own uniqueness and never two people have the exact same life experience, it is almost certain that the learning style of each person is different from one another. Two individuals who grow up in the same conditions and environment and even though they receive the same treatment will not necessarily have the same understanding of thoughts and views of the world around them. Each has his own perspective on every event he saw and experienced. Learning styles have an important role in the educational process.

Montgomery & Groat (1998) stated that there are several reasons why learning styles need to be noticed in the teaching process. It refers to the process to make the learning process more dialogical, to understand students more differently by adjusting the knowledge base of the learner, the suitability of the task, the main areas, and the careers to suit the personality functions, talents, and to make the teaching process more appreciative of what students already have.

It is called individuals with field dependence learning styles when individuals perceive themselves to be controlled by the environment. As for individuals who have a field independence learning style is when individuals perceive themselves that most behaviors are not influenced by the environment. Some typical characteristics possessed by individuals with field dependence learning styles, are that these individuals have extroverted traits, tend to be motivated from the outside and much influenced by community groups or learning and authority figures, experiencing more global events. (Witkin *et al*., 1971). Individuals with field dependence learning styles like the approach of an 'audience approach' when learning. As for individuals with field independence learning styles have an introverted nature, tend to be motivated from within or self (for example, self-study) and are less affected by social reinforcement, like competition, choose activities, and work structurally and Field-independent personalities have a social orientation lower, compared to field-dependent personalities. Individuals with field independence learning styles like learning that has clear goals and gives them more freedom of learning (Witkin *et al*., 1971).

Hofer (2002) assert that epistemological beliefs are related to personality. Likewise, Wood & Kardash (2002); Wood, Kitchener, & Jensen (2002) also say that epistemological beliefs are related to personality components, while learning styles are part of personality. According to Garland (1993), the position of epistemological belief determines differences in learning styles such as analytical / serial / field independent / left brained vs. global / holistic / field dependent / right brained learning styles.

Hashim *et al*. (2009) who conducted research on the relationship between personal epistemology and learning styles mediated by self-efficacy which the results showed that personal belief has a positive and direct effect on learning style. An empirical examination from Günes *et al*. (2017) on epistemic views with learning styles in the preparatory program shows that pre-service teachers adopt philosophical skepticism and tends to favor an active learning style, and there is a significant relationship between learning styles and the pre-service teacher's epistemic outlook. The results of this study are also in accordance with Tümkaya (2012) conducted to 246 women and 242 men, a total of 488 students with the results showing that most students have learning styles of assimilation and converging. Moreover, there is no meaningful difference in the sub-dimension of beliefs about learning depends on effort in determining individual learning styles. On the other hand, it shows that in the sub-dimension of belief about learning depends on ability there is one unchanging assumption that is determined by diverging learning style.

Understanding the role of belief in knowledge is important in assisting learners in using effective learning strategies to achieve academic goals. Bråten & Strømsø (2005) find in students, who believe that knowledge is stable and can only be obtained through the teacher's authority, will be less goal-oriented and more oriented to memorizing. Students with low belief or even doubt in knowledge structures such as simple structured knowledge. They will have little or no intrinsic learning orientation, no respect for learning activities, no control over learning and feeling that they can carry out a learning task. Similarly, students' beliefs in the stability of knowledge such as absolute, tentative or transient knowledge and students' beliefs in the source of knowledge that knowledge comes from a more knowledgeable person, from the experience of an authority to convey knowledge or derive from his own thoughts followed by various evidence.

From the results, this study highlights some noticeable findings regarding knowledge, learning style and epistemic beliefs. Knowledge is attributed as certain, absolute, unchanged, and not tentative. Students who have epistemic beliefs with field-dependent learning style tend to believe that knowledge is tentative and unpredictable, and does not believe that knowledge is fixed and immutable (Jehng, Johnson, & Anderson, 1993). Furthermore, knowledge is believed to come from more knowledgeable or authority or expert with superior knowledge such as lecturers or reference books, compared to individual logic and thought. In this dimension, the student does not have a knowledge perspective, thus believing that the information from the reference book is true, and that the teacher must convey the material in the learning process (Jehng *et al*., 1993; Schommer, 1990; 1994).

This is different for students who have more sophisticated epistemic beliefs with field-independent learning style, which emphasize more on the notion that knowledge comes from the constructs of their own thinking. According to Marchant (1992), students are inclined to accept what is delivered by the lecturer. Thus, this condition causes the individual to be very dependent on the environment and in learning to show field-independence. In terms of the orderly process as a contruct for epistemic belief, Jehng *et al*. (1993) explained that the dimensions of a regular process, or so-called rigid learning is the belief dimension of whether learning is a process that the individual passively receives the finished knowledge, or the process of formulating facts in which individuals independently build their ideas. In this dimension, the students' perspective prefers learning by taking the material exactly or in the same way as what they read in reference books and tend to follow what is written there from beginning to end (Jehng *et al*., 1993).

Theoretically, the results of this study are insightful in understanding the influence of epistemic beliefs on knowledge and learning on learning styles that are very likely to be chosen by students. A high level of belief in learning and learning has a significant relationship with field-dependent learning styles. This implies that students are more likely to involve themselves in the team, discuss learning problems and tasks with partners and teachers, and have more interpersonal relationships with the surrounding context as a result of the increased belief in knowledge and learning. Furthermore, as a consequence of contingency logic, students with field-dependent learning styles are also more likely to reduce or negate the level of belief that knowledge and learning can be obtained from their own abilities.

Empirically, this is evidenced by the negative results and significant influence of beliefs on learning in field-independent learning styles. Practically, this study is useful for teachers and educators in designing learning models, where learning based on individual abilities such as reading and writing will make students more likely be field-independent learners, because of the lack of need for interaction with peers in learning activities. Furthermore, high student belief that academic abilities can only be achieved with the involvement of the surrounding environment will enable them to be active in groups. In this context, learning materials such as discussions and joint assignments will be able to encourage them to strive academically according to their epistemic beliefs.

CONCLUSION

Based on the results of the data analysis and discussion above, the conclusions that can be taken in this study are as follows. 1) That the proposed model design does not differ significantly from empirical data. This means the

corresponding theoretical model with empirical data is acceptable. 2) Statistical examination shows the positive and significant effect of exogenous variable in the form of variable of belief in knowledge on field-dependent learning style. However, this variable has no effect on field-independence learning style. 3) The belief in learning had a significant positive effect on the field-dependent learning style and a negative and significant influence on the field-independent learning style. Based on the results of this study it is suggested that educational institutions need to provide and enrich the development of epistemological beliefs in students in order to open opportunities for them to reflect not only on their learning style tendencies, but also about how and why certain learning styles are formed, and more specifically helps them to 'learn how to learn'.

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EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE

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Abstract: Research in contemporary education over the past few decades has led to considering the influence of non-cognitive factors such as learning styles in various learning behaviors. This study aims to examine the influence of the epistemic beliefs that consist of belief in knowledge and belief in learning on field-dependent and field-independent learning styles. The sample consisted of 129 students at the Early Childhood Islamic Education Study Program, Department of Islamic Education, Kudus State Islamic Institute through the simple random sampling technique. The data collection technique was through the use of questionnaires. There are three scales employed in this study, namely epistemological trust scale, dependent learning style and independent learning style. Data were analyzed by using Structural Equation Modeling. The results show that the belief in learning has a significant and positive effect on the field-dependent and field-independent learning style. Meanwhile, the belief in learning has only a significant and negative effect on the field-independent learning style and has no significant effect on field-dependent learning style. The results provide some insightful considerations regarding the utilization of epistemic beliefs for improving learners' interaction with the surrounding context to obtain an optimal academic performance.

Keywords: Epistemic beliefs, field-dependent, field-independent, learning style

KEPERCAYAAN EPISTEMOLOGIS TENTANG GAYA BELAJAR DEPENDEN DAN GAYA BELAJAR INDEPENDEN

Abstrak: Penelitian dalam pendidikan kontemporer selama beberapa dekade terakhir telah mendorong mempertimbangkan pengaruh faktor non-kognitif seperti gaya belajar dalam berbagai perilaku belajar. Penelitian ini bertujuan untuk mendeskripsikan pengaruh kepercayaan epistemologis yang terdiri atas kepercayaan tentang pengetahuan dan belajar pada gaya belajar dependen dan independen. Sampel penelitian ini terdiri atas 129 siswa program studi Pendidikan Islam Anak Usia Dini, Jurusan Tarbiyah Sekolah Tinggi Agama Islam Negeri Kudus melalui teknik simple random sampling. Teknik pengumpulan data yang digunakan adalah kuesioner dalam bentuk skala yang diadopsi dari penelitian sebelumnya. Ada tiga skala yang digunakan dalam penelitian ini, yaitu skala kepercayaan epistemologis, gaya belajar dependen dan gaya belajar independen. Data dianalisis dengan menggunakan model Structural Equation Modeling. Hasil penelitian menunjukkan bahwa kepercayaan dalam belajar memiliki efek yang signifikan dan positif pada gaya belajar dependen dan independen. Sementara itu, kepercayaan tentang belajar hanya memiliki efek yang signifikan dan negatif pada gaya belajar independen, dan tidak memiliki efek signifikan pada gaya belajar dependen. Hasilnya memberikan beberapa pertimbangan mendalam tentang pemanfaatan kepercayaan epistemologis untuk meningkatkan interaksi peserta didik dengan konteks sekitarnya untuk mendapatkan kinerja akademik yang optimal.

Kata Kunci: Kepercayaan epistemologis, dependen, independen dan gaya belajar

INTRODUCTION

Various studies of psychology and education reveal that the learning style is considered not directly obtained by students from within themselves as it is highly related with cognitive, affective and psychological process (Felder & Silverman, 1988; Reid, 1987; Mayer & Massa, 2003). It means that even though

everyone has feelings, can develop his interests, and has the ability to think, everyone is different from other people's way of feeling, the way he develops his thoughts, the way he determines the development of his personal interests. Likewise, their tendency to choose a learning style obtained during the learning period will be profoundly affected by the learning process and the involvement of academic environment. In this context, students will relate to the external environment such as teachers, partners, and texts as references used in learning.

In addition, students' needs for the environment and their dependence on factors outside them will be strongly related to how they perceive the value of knowledge, the process of knowing, and the use of learning. This relates to the fact that the way a person processes and reacts to different needs that come from outside himself is different from how other people does it. Here, it should be noted that learning is not only solely related to the process at school, but also related to the extent to which students fundamentally believe the knowledge and learning (Muis, 2007; Bendixen, 2002).

Practically, understanding of knowledge will determine the extent to which students depend on the environment, learning style, and personal tendencies and orientation chosen for the success of the study. Students with an understanding that knowledge can be obtained by their own business are more likely to work individually and less dependent on others. Conversely, students with an understanding that knowledge can only be obtained from others or experts with higher knowledge authority will be more likely to be dependent on others and the environment. The first group is called field-independent learners which more tend to be actively involved in teams, work on group assignments and material discussion, and the second group is classified as field-dependent learners, which is is less dependent on teachers and peers, and more competitive in learning activities based on reading and writing (Kienhues, 2015). In short, field-dependent learners are less able to separate the context from the environment, while field-independent learners are better able to separate details from the context of the environment. In this view, they will have a high degree of involvement in the team, intensive interpersonal relationships, and participation in groups in the completion of tasks.

The extent to which students' understanding and belief in knowledge and learning and their effects on the choice of learning styles perceptions about academic achievements are more likely to involve the environment (field-dependent), or focusing on themselves (field independent) has not received much attention from previous studies (e.g Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Higgins, Peterson, Pihl, & Lee, 2007; Rohde & Thompson, 2007).

In the last few decades, predictions of academic success are highly emphasized on cognitive factors such as intelligence and academic ability, although recently, researchers in the field of education and social sciences have realized that non-cognitive factors and skills play an important role in the success and achievement of education (McKenzie & Schweitzer, 2001; Bastian, Burns, & Nettelbeck, 2005; Nasim, Roberts, Harrell, & Young, 2005). It is strongly believed that non-cognitive skills factors are the same or even more important than the cognitive aspects of the education and work process (Khine, 2016).

Furthermore, previous research tends to be more interested in examining aspects of learning styles that are more concrete to be tested empirically, compared to examining the relationship between learning styles and epistemic beliefs (Franzoni, Assar, Defude, & Rojas, 2008; Komarraju, Karau, Schmeck, & Avdic, 2011; Hsieh, Jang, Hwang, & Chen, 2011; Wong & Nunan, 2011). Here, it is assumed that student learning styles are the reflection of students' understanding and beliefs regarding knowledge and learning functions. This is related to the function of learning styles capable of explaining how individuals learn or how each person concentrates on the process, and masters difficult and new information through different perceptions. Style is personal characteristics for each person, and it serves to distinguish one person from another. Thus, in general the learning style is assumed to refer to the personalities, beliefs, choices, and behaviors used by individuals to assist in their learning in a conditioned situation.

Epistemic Beliefs and Learning Style

One important and decisive factor in exposing the use of learning strategies used by students is the students' epistemic beliefs. Huglin (2003) conducted research on personal epistemology with learning styles (feeler, thinker, sensor and intuiter) showed that these four learning styles differ significantly in terms of epistemic beliefs. Hashim, Ramly & Ishak (2009), exploring the relationship between personal epistemology and learning styles mediated by self-efficacy, found that personal belief has a direct and positive effect on learning style. Günes, Bati & Katranci (2017) shows that statistically, significant relationships were found between participants' learning styles and their epistemic outlook. The personality models of field-dependent - field-independent learning style are the derivation of learning style theory (Witkin, Oltman, Raskin, & Karp, 1971). The individual considered as having a field-dependent learning style is when he perceives himself under the influence of the environment. Instead, the individual is considered to have a field-independent learning style when he perceives that most behaviors are not influenced by the environment.

Various studies have shown that epistemic beliefs influence the use of approaches in learning (Cano, 2005; Phan, 2006; Tsai & Chuang, 2005; Bråten & Strømsø, 2005). Educational researchers such as Hofer & Pintrich (1997) claim that epistemic beliefs play an important role in academic behaviors, such as influencing the use of techniques in learning, for example, students who believe that the knowledge structure consists of cut- pieces that are not related to information, are likely to use memorization techniques as a learning technique and not an understanding technique. The study also concludes that students who see equally unchanging and stable knowledge tend to use memorization techniques of scientific facts. In contrast, learners who view knowledge as dynamic will prioritize aspects of information understanding (Davis, 1997). Moreover, students who believe that understanding technique is the best strategy in learning will have better results at the final exam than those who believe that memorizing techniques are the best (Davis, 1997).

Chan (2007) argues that learning behavior is strongly influenced by students' beliefs in the nature of their knowledge and abilities. For field-independent learners, they are not much influenced by authority, social and external figures outside of themselves and more guided by their own needs. Their dominant characteristics are closed nature (introvert), tendency to perform an activity on their own initiative to the best of their abilities (e.g., self-study) even without being motivated or persuaded by the people around them, working regularly and focusing and loving competition. Compared with a field-dependent personality, field-independent individuals have a lower social orientation, (Witkin *et al*., 1971). Witkin *et al*. (1971) also said that individuals with a field-independent learning style have a clear purpose and more freedom to learn.

This study attempts empirically to examine the effect of epistemic beliefs in the forms of belief in knowledge and belief in learning in the choice of learning styles from field-dependent or field-independent. Conceptually, this study adopts the logic theory of contingency, primarily the logic of contradiction, where it is assumed that students with high belief, either in knowledge or in learning, will only have a logical choice regarding the selection of learning styles of field-dependent or field-independent. This model is considered more likely to be able to offer empirical evidence that is more consequent to the learner's belief epistemic level.

METHODS

Research Design

This study seeks to examine the effect of epistemic beliefs on learning styles in students. Regarding the selection of respondents at the tertiary level, and not at the lower levels of the school, this study confirms to test the sustainability of the epistemic belief in learning styles. This is basically the selection of learning styles and beliefs in knowledge and knowing seems to have been formed during the previous education period.

Sampling

Population in this research is all students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute amounting to 252 students. The selection of students in the

Early Childhood Islamic Education program is because these students become prospective teachers at the initial level of pre-school learning which forms the basis for the development o epistemological beliefs and learning styles for their students. The sampling technique in this study uses Proportional Random Sampling techniques by lottery. In random sampling each class in the population has the opportunity to be sampled. The proportion used to determine the number of samples in each class is 10% of the total number of students of the PIAUD study program. The number of samples obtained was 129 students. The sample distribution using Proportional Random Sampling in each batch can be seen in Table 1.

Research Instruments

The method used to obtain data in this study is a questionnaire or questionnaire, a method based on self-report knowledge in personal beliefs. There are three types of scales, namely the epistemological trust scale, the scale of dependent learning styles and the scale of independent learning styles. Epistemic belief in this research is divided into two components of belief, that are the belief in knowledge and belief in learning. The belief in knowledge (BK) is the individual's belief in the nature of knowledge which includes aspects, such as; (1) knowledge comes from an expert/knowledge expert, (2) certain knowledge, and (3) orderly process.

Field-dependent learning style (FD) is a certain pattern that is stable when the individual accepts, interacts, absorbs, stores, organizes, and processes information with the individual's tendency to look at something globally, makes wide concept distinctions, shows social orientation and sets goals and reinforcement. This variable is expressed using the scale of the field-dependent learning style with the components as characterized by Witkin *et al*. (1971). Furthermore, individuals with a field-independent learning style (FI) have a tendency to look at things analytically, to make certain concepts distinct, to show an impersonal orientation and have their own designed goals. This variable is expressed using a field-independent learning style scale with components as characterized by Witkin *et al*. (1971). The example of item lattice for each variable can be seen in Table 2.

Data Analysis Technique

The technique used to analyze data in this research was Structural Equation Models or also called Structural Equation Model. As for the needs of analysis, the software program Analysis of Moment Structures (AMOS) was used.

FINDINGS AND DISCUSSION

Findings

The age characteristics of respondents selected as samples of this study ranged from 18 to 26 years old. Almost all respondents were women. The majority of respondents aged between 18-20 years with a total of 91 people or 70.54%. In terms of the semester level, sampling is quite even at all levels of lecture (Table 3).

Descriptive statistics reveals the values of minimum, maximum, and mean and standard deviations for each question item. The mean value for each item ranged in the range of 2.33-3.05, indicating the medium tendency of the sample in the item in question (Table 4).

Furthermore, to show how strong the influence between variables is, the correlation test with Pearson technique is done. Pearson correlation test results showed that out of 6 corelations, there were 3 significant correlational relationships between variables. Field-Dependent learning style (FD) is proven statistically to have negative and significant relation with belief in learning (BL) (FD-BL, -.213, significant at .015). The results also show that the Field-Independent Learning variable has a positive and significant correlation in the two exogen constructs of belief in knowledge (FI-BL, .247; .005), and from belief in Learning (FI-BL, .320; .00) (Table 5).

Testing with SEM requires a confirmatory test as a means to validate the measurement model of latent constructs (Awang, 2012). The results of the validity test showed that all items had a standardized loading score above .7 as a validity standard. Therefore, all items are declared valid. Moreover, the results of the reliability calculation of the FD learning style scale obtained a value of .71, while the FI learning style gained a reliability score of .74. The results of the reliability of BK gained .91, while BL gained a score of .81. Thus, the entire variables obtain good reliability scores above .70. Thus, all the variables used have met reliability requirements (Table 6).

Table 1. Distribution of Samples

No.	Semester (Admission Year)	Number of Students	Female	Male	Sample
1.	1 (2016)	52	52	0	26
2.	3 (2015)	70	70	0	36
3.	5 (2014)	64	62	2	33
4.	7 (2013)	66	65	1	34
Total		**252**	**249**	**3**	**129**

Table 2. Item Grids

Variable	Indicator	Example Item Grids
Belief about knowledge	Certain knowledge	I like classes where the lecturer sets the lecture program before teaching
	Omniscient	The answers in the reference book are helpful as I am not sure of my own solutions
	Simple knowledge	I feel comfortable when faced with uncertain learning conditions
Belief about learning	Innate ability	Students who have moderate achievement during high school will remain the same and have moderate achievements when they become students in Higher Education
	Quick learning	If I can not understand something quickly, I usually have difficulty in learning it as a whole
Field dependent learning style	Viewing matters globally	I don't mind reading or listening without understanding each word as long as I can take the main idea
	Creating wide concept differences	When I study, I prefer simple and general material
	Showing social orientation	I enjoy studying together with friends
	Determine goals and improvements	I need a calm atmosphere in order to concentrate well
Field independent learning style	Viewing matters analytically	If I study, I understand the material in great detail (meticulously to the small things).
	Creating particular concept differences	I have to understand every word of what I hear and read
	Showing impersonal orientation	I like studying alone
	Possessing self designed goals	I finished my job as well as I could before I moved on to finish another task

Table 3. Respondent Characteristics

Characteristics	Frequency	Percent	Remark
Gender			
Female	127	98.45	
Male	2	1.55	
Age			
18-20	91	70.54	
21-25	24	18.60	
>26	14	10.85	

Table 4. Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev
Belief in knowledge (BK)				
BK1	1	4	2.65	.669
BK2	1	4	2.71	.687
BK3	1	4	2.83	.601
Belief in learning (BL)				
BL1	1	4	2.40	.701
BL2	1	3	2.33	.700
Field-dependent (FD)				
FD1	1	4	2.81	.808
FD2	1	4	2.84	.755
FD3	1	4	2.52	.708
FD4	1	4	2.81	.751
Field-independent (FI)				
FI1	1	4	2.34	.815
FI2	1	4	3.05	.759
FI3	1	4	2.78	.763
FI4	1	4	2.88	.725

Table 5. Correlation Matrix of Variables

Parameters	BK	BL	FD	FI
BK	1.00			
BL	.053 (.554)	1.00		
FD	-.088 (.320)	-.213* (.015)	1.00	
FI	.247** (.005)	.328** (.000)	.081 (.359)	1.00

**. Correlation is significant at the .01 level (2-tailed); *.05 level (2-tailed).

Table 6. Standarized Loading and Reliability

Variable	Loading Factor	Reliability
Belief about knowledge		.91
Certain knowledge	.81	
Omniscient	.77	
Simple knowledge	.86	
Belief about learning		.81
Innate ability	.94	
Quick learning	.74	
Field dependent learning style		.71
Viewing matters globally	.76	
Creating wide concept differences	.87	
Showing social orientation	.63	
Determine goals and improvements	.75	
Field independent learning style		.74
Viewing matters analytically	.93	
Creating particular concept differences	.88	
Showing impersonal orientation	.77	
Possessing self designed goals	.79	

Ghozali (2008) and Setiyowati, Pali, Wiyono & Triyono (2019), before the analysis of the model of structural equation as a whole is done, a unidimensionality test on each construct is done with confirmatory factor analysis. This unidimensionality test is conducted to determine whether the constructor measurement indicators have provided reliable results. Unidimensionality test of this research is done by seeing whether the grain discrimination power (total grain correlation) of construct indicator in this research is significant. The test is also done by looking at the convergent validity or loading factor value of each indicator. Confirmatory analysis is performed between exogenous variables and between indogenous variables. In this model, there are exogenous variables that are epistemic beliefs that consist of belief in knowledge and belief in learning. The indogenous variables consist of two kinds of learning style that is field-dependent and field-independent. The results of confirmatory analysis between exogenous and indogenous variables indicate that the value of fit criteria has been achieved well. Similarly, the significance value of standarized loading parameter estimation is all above .05, so it can be said fit. After several proposed conditions are met, the next step is to test the hypothesis of testing theoretical model data with the overall empirical data.

The results of of analysis of full model on stage 1 the initial structural model analysis showed that Chi-Square 76.527 (DF = 60. p = .074), CMIN/DF = 1.275, GFI = .918, AGFI = .875, TLI = .975 and RMSEA = .046. That the criteria of acceptance requirements of the model can be fulfilled. Based on the result of the significance analysis p = .074 and yet it will try to re-estimate to get better result again. The re-estimation of the model in this study through model modification. Of course modification of the model can still be done provided that the fit model was not found in accordance with empirical data, and as long as it does not deviate from the proposed theory. Modification of the model can be done by modifying the direction of the relationship between variables that already exist in the model, adding or reducing latent variables or observation variables as far as still in the frame of conceptual research support model.

As for model modification analysis in this study is to see the output on Modification Indices (MI) on AMOS 16 analysis that has been done. The output of Modification Indices recommends about the error variables that must be done further to be modified is to connect, e1 with e7, e3 with e6 and e9 with e12. After that the retesting process is done, the results of this re-analysis show an improvement for the Goodness of Fit criteria (Figure 1).

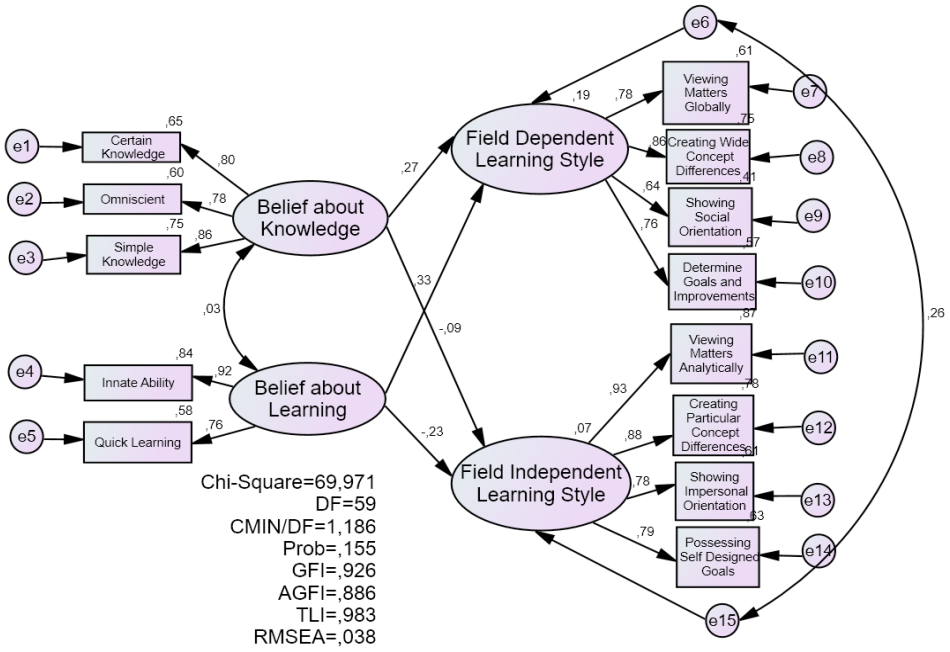

Figure 1. Results of the Modified Indices (MI) Analysis

Based on the retesting process it was found that the criterion requirement improved as the probability result from p = .074 to .155, the GFI value from .918 rose to .926, the AGFI from .875 to .886, the TLI from .975 to .983 and the RMSEA decreased from .046 to .038.

Thus, the relationship model undergoes improvement (Figure 1). Thus, it can be stated that the proposed model design does not differ significantly from empirical data. Based on these results then the researchers no longer need to modify the model, so the model can be used in this study. This means the hypothesis that there is a corresponding theoretical model with empirical data is acceptable.

Hypothesis testing is based on the value of estimated loading which is the evaluation of regression weight between latent variables and degree of freedom (*df*), and he critical ratio (C.R) value or t-arithmetic with probability value (*p*) of .05 for the belief level of 95% (Table 7).

Statistical test results show that the belief in knowledge has a positive and significant effect on the field-dependence learning styles, which is indicated by estimate (*r*) .252 C.R value of 2.617 and a significance value (*p*) of .009 < .05. Accordingly, the first hypothesis is accepted. These results reveal that the higher belief in knowledge is more likely to increase learner dependence on the environment. In a related context, these results suggest the possibility that the high level of belief in knowledge will more likely to increase students' interpersonal abilities and improve the capacity of participation in teams and involvement in problem solving.

The next hypothesis attempts to examine the effect of the variable of belief in knowledge on field-independence learning styles. The test results showed r = -.964 and C.R value of -.964 with a significance value (*p*) .335> .05. This means that the variable belief in knowledge has a negative effect on field-independence learning styles. Thus, the second hypotsis is rejected. In the affirmative question model, by analyzing the influence of epistemic beliefs on learning styles chosen by students, negative and insignificant results from the variables of belief in knowledge of field-independence learning styles reinforced that students with a high degree of belief in knowledge were more likely to have field-dependence learning styles as shown by the acceptance of first hypothesis.

The third test is to analyze the influence of belief in learning on field-dependence learning styles. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style, which is indicated by the value of C.R 2.542 and p value .011. Then, the third hypothesis is accepted. These results reveal that high belief in learning will tend to make students have a field-dependence learning style. In other words, students will be more intensive in interpersonal relationships and team involvement, compared to solely relying on themselves which is a special characteristic of field-independence learning styles in the learning process.

The next test examined the fourth hypothesis that belief in learning had a negative and significant influence on field-independence learning styles. The test results reveal the value of C.R -2.416 and a significance value of .016. These results demonstrate that students' belief in the importance of learning is negatively related to the likelihood of them choosing the field-dependence learning style. Thus, the fourth hypothesis is accepted. These results affirmatively also confirm the third hypothesis, expressing the tendency of students to become more actively involved in the team and other people, and consider environmental factors, as they increasingly believe in the importance of learning. This is because students are considered to have only one rational choice of the learning style, either field-independence or dependence field. This entire test confirms that students' high belief in the importance of knowledge and intensive learning will be proportionally related

Table 7. Regression Weights of the Causality Test

Hypothesis	Sign	Estimate	S.E.	C.R.	*P*	Evaluation
FD ← BK	+ (< .05)	.252	.96	2.617	.009	Accepted
FI BK	- (< .05)	-.119	.124	-.964	.335	Rejected
FD ← BL	+ (< .05)	.267	.105	2.542	.011	Accepted
FI ← BL	- (< .05)	-.259	.107	-2.416	.016	Accepted

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to their awareness to involve the environment, peers, and groups, to support the success of their studies.

Discussion

The study showed empirical evidence that the proposed model design does not differ significantly from empirical data. This means the corresponding theoretical model with empirical data is acceptable. The belief in knowledge has a positive and significant effect on the field-dependence learning styles and the variable belief in knowledge has a negative effect on field-independence learning styles but rejected. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style. The belief in learning had a negative and significant influence on field-independence learning styles.

Each individual has its own uniqueness and never two people have the exact same life experience, it is almost certain that the learning style of each person is different from one another. Two individuals who grow up in the same conditions and environment and even though they receive the same treatment will not necessarily have the same understanding of thoughts and views of the world around them. Each has his own perspective on every event he saw and experienced. Learning styles have an important role in the educational process.

Montgomery & Groat (1998) stated that there are several reasons why learning styles need to be noticed in the teaching process. It refers to the process to make the learning process more dialogical, to understand students more differently by adjusting the knowledge base of the learner, the suitability of the task, the main areas, and the careers to suit the personality functions, talents, and to make the teaching process more appreciative of what students already have.

It is called individuals with field dependence learning styles when individuals perceive themselves to be controlled by the environment. As for individuals who have a field independence learning style is when individuals perceive themselves that most behaviors are not influenced by the environment. Some typical characteristics possessed by individuals with field dependence learning styles, are that these individuals have extroverted traits, tend to be motivated from the outside and much influenced by community groups or learning and authority figures, experiencing more global events. (Witkin *et al*., 1971). Individuals with field dependence learning styles like the approach of an 'audience approach' when learning. As for individuals with field independence learning styles have an introverted nature, tend to be motivated from within or self (for example, self-study) and are less affected by social reinforcement, like competition, choose activities, and work structurally and Field-independent personalities have a social orientation lower, compared to field-dependent personalities. Individuals with field independence learning styles like learning that has clear goals and gives them more freedom of learning (Witkin *et al*., 1971).

Hofer (2002) assert that epistemological beliefs are related to personality. Likewise, Wood & Kardash (2002); Wood, Kitchener, & Jensen (2002) also say that epistemological beliefs are related to personality components, while learning styles are part of personality. According to Garland (1993), the position of epistemological belief determines differences in learning styles such as analytical / serial / field independent / left brained vs. global / holistic / field dependent / right brained learning styles.

Hashim *et al*. (2009) who conducted research on the relationship between personal epistemology and learning styles mediated by self-efficacy which the results showed that personal belief has a positive and direct effect on learning style. An empirical examination from Günes *et al*. (2017) on epistemic views with learning styles in the preparatory program shows that pre-service teachers adopt philosophical skepticism and tends to favor an active learning style, and there is a significant relationship between learning styles and the pre-service teacher's epistemic outlook. The results of this study are also in accordance with Tümkaya (2012) conducted to 246 women and 242 men, a total of 488 students with the results showing that most students have learning styles of assimilation and converging. Moreover, there is no meaningful difference in the sub-dimension of beliefs about learning depends on effort in determining individual learning styles. On the other hand, it shows that in the sub-dimension of belief about learning depends on ability there is one unchanging assumption that is determined by diverging learning style.

Understanding the role of belief in knowledge is important in assisting learners in using effective learning strategies to achieve academic goals. Bråten & Strømsø (2005) find in students, who believe that knowledge is stable and can only be obtained through the teacher's authority, will be less goal-oriented and more oriented to memorizing. Students with low belief or even doubt in knowledge structures such as simple structured knowledge. They will have little or no intrinsic learning orientation, no respect for learning activities, no control over learning and feeling that they can carry out a learning task. Similarly, students' beliefs in the stability of knowledge such as absolute, tentative or transient knowledge and students' beliefs in the source of knowledge that knowledge comes from a more knowledgeable person, from the experience of an authority to convey knowledge or derive from his own thoughts followed by various evidence.

From the results, this study highlights some noticeable findings regarding knowledge, learning style and epistemic beliefs. Knowledge is attributed as certain, absolute, unchanged, and not tentative. Students who have epistemic beliefs with field-dependent learning style tend to believe that knowledge is tentative and unpredictable, and does not believe that knowledge is fixed and immutable (Jehng, Johnson, & Anderson, 1993). Furthermore, knowledge is believed to come from more knowledgeable or authority or expert with superior knowledge such as lecturers or reference books, compared to individual logic and thought. In this dimension, the student does not have a knowledge perspective, thus believing that the information from the reference book is true, and that the teacher must convey the material in the learning process (Jehng *et al*., 1993; Schommer, 1990; 1994).

This is different for students who have more sophisticated epistemic beliefs with field-independent learning style, which emphasize more on the notion that knowledge comes from the constructs of their own thinking. According to Marchant (1992), students are inclined to accept what is delivered by the lecturer. Thus, this condition causes the individual to be very dependent on the environment and in learning to show field-independence. In terms of the orderly process as a contruct for epistemic belief, Jehng *et al*. (1993) explained that the dimensions of a regular process, or so-called rigid learning is the belief dimension of whether learning is a process that the individual passively receives the finished knowledge, or the process of formulating facts in which individuals independently build their ideas. In this dimension, the students' perspective prefers learning by taking the material exactly or in the same way as what they read in reference books and tend to follow what is written there from beginning to end (Jehng *et al*., 1993).

Theoretically, the results of this study are insightful in understanding the influence of epistemic beliefs on knowledge and learning on learning styles that are very likely to be chosen by students. A high level of belief in learning and learning has a significant relationship with field-dependent learning styles. This implies that students are more likely to involve themselves in the team, discuss learning problems and tasks with partners and teachers, and have more interpersonal relationships with the surrounding context as a result of the increased belief in knowledge and learning. Furthermore, as a consequence of contingency logic, students with field-dependent learning styles are also more likely to reduce or negate the level of belief that knowledge and learning can be obtained from their own abilities.

Empirically, this is evidenced by the negative results and significant influence of beliefs on learning in field-independent learning styles. Practically, this study is useful for teachers and educators in designing learning models, where learning based on individual abilities such as reading and writing will make students more likely be field-independent learners, because of the lack of need for interaction with peers in learning activities. Furthermore, high student belief that academic abilities can only be achieved with the involvement of the surrounding environment will enable them to be active in groups. In this context, learning materials such as discussions and joint assignments will be able to encourage them to strive academically according to their epistemic beliefs.

CONCLUSION

Based on the results of the data analysis and discussion above, the conclusions that can be taken in this study are as follows. 1) That the proposed model design does not differ significantly from empirical data. This means the

corresponding theoretical model with empirical data is acceptable. 2) Statistical examination shows the positive and significant effect of exogenous variable in the form of variable of belief in knowledge on field-dependent learning style. However, this variable has no effect on field-independence learning style. 3) The belief in learning had a significant positive effect on the field-dependent learning style and a negative and significant influence on the field-independent learning style. Based on the results of this study it is suggested that educational institutions need to provide and enrich the development of epistemological beliefs in students in order to open opportunities for them to reflect not only on their learning style tendencies, but also about how and why certain learning styles are formed, and more specifically helps them to 'learn how to learn'.

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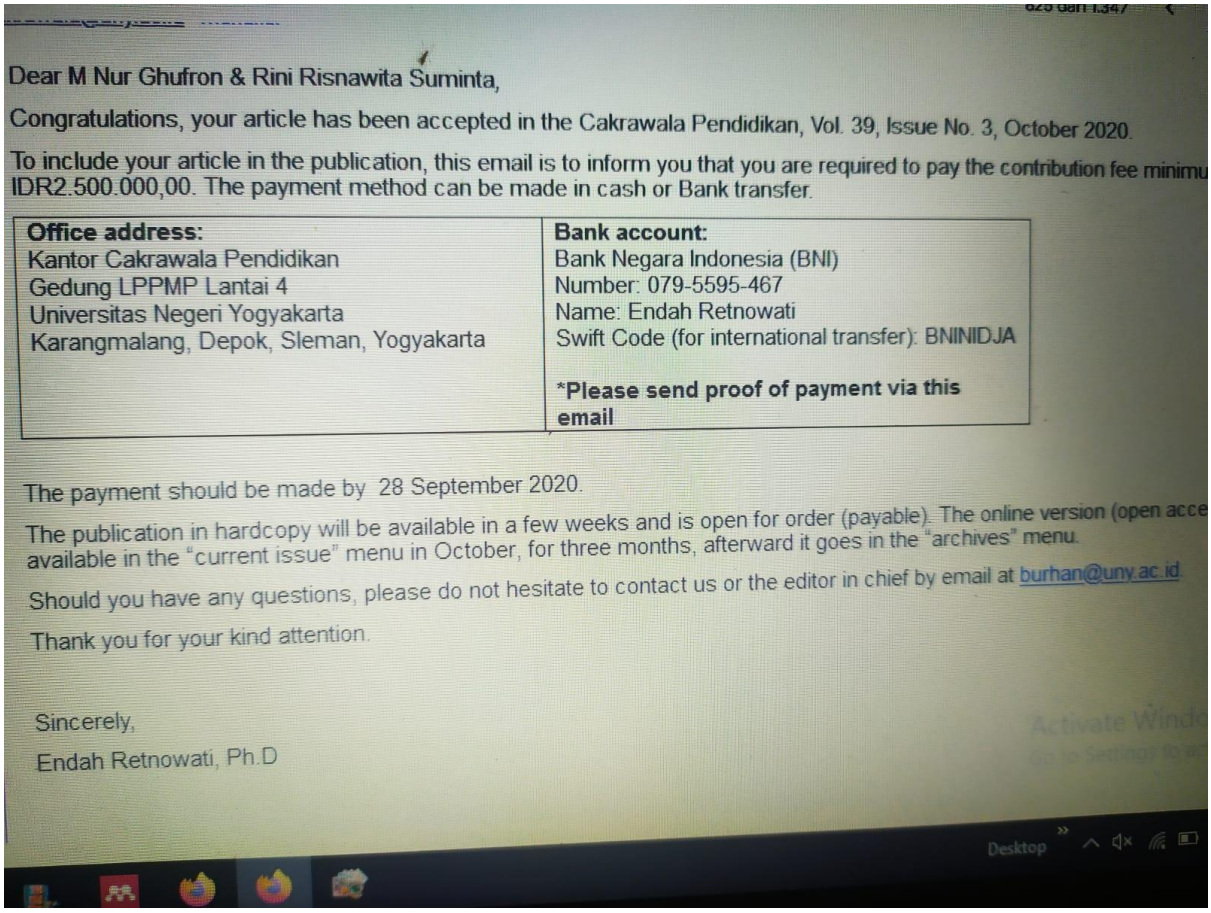

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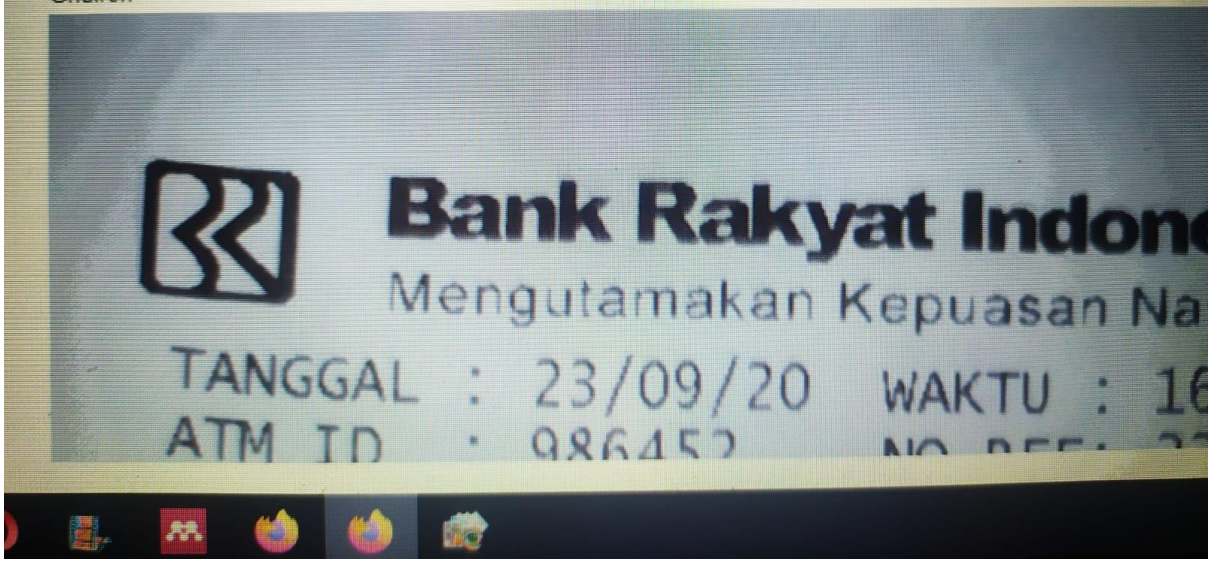

EPISTEMIC BELIEFS ON FIELD-DEPENDENT AND FIELD-INDEPENDENT LEARNING STYLE

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Abstract: Research in contemporary education over the past few decades has led to considering the influence of non-cognitive factors such as learning styles in various learning behaviors. This study aims to examine the influence of the epistemic beliefs that consist of belief in knowledge and belief in learning on field-dependent and field-independent learning styles. The sample consisted of 129 students at the Early Childhood Islamic Education Study Program, Department of Islamic Education, Kudus State Islamic Institute through the simple random sampling technique. The data collection technique was through the use of questionnaires. There are three scales employed in this study, namely epistemological trust scale, dependent learning style and independent learning style. Data were analyzed by using Structural Equation Modeling. The results show that the belief in learning has a significant and positive effect on the field-dependent and field-independent learning style. Meanwhile, the belief in learning has only a significant and negative effect on the field-independent learning style and has no significant effect on field-dependent learning style. The results provide some insightful considerations regarding the utilization of epistemic beliefs for improving learners' interaction with the surrounding context to obtain an optimal academic performance.

Keywords: epistemic beliefs, field-dependent, field-independent, learning style

KEPERCAYAAN EPISTEMOLOGIS TENTANG GAYA BELAJAR DEPENDEN DAN GAYA BELAJAR INDEPENDEN

Abstrak: Penelitian dalam pendidikan kontemporer selama beberapa dekade terakhir telah mendorong mempertimbangkan pengaruh faktor non-kognitif seperti gaya belajar dalam berbagai perilaku belajar. Penelitian ini bertujuan untuk mendeskripsikan pengaruh kepercayaan epistemologis yang terdiri atas kepercayaan tentang pengetahuan dan belajar pada gaya belajar dependen dan independen. Sampel penelitian ini terdiri atas 129 siswa program studi Pendidikan Islam Anak Usia Dini, Jurusan Tarbiyah Sekolah Tinggi Agama Islam Negeri Kudus melalui teknik simple random sampling. Teknik pengumpulan data yang digunakan adalah kuesioner dalam bentuk skala yang diadopsi dari penelitian sebelumnya. Ada tiga skala yang digunakan dalam penelitian ini, yaitu skala kepercayaan epistemologis, gaya belajar dependen dan gaya belajar independen. Data dianalisis dengan menggunakan model Structural Equation Modeling. Hasil penelitian menunjukkan bahwa kepercayaan dalam belajar memiliki efek yang signifikan dan positif pada gaya belajar dependen dan independen. Sementara itu, kepercayaan tentang belajar hanya memiliki efek yang signifikan dan negatif pada gaya belajar independen, dan tidak memiliki efek signifikan pada gaya belajar dependen. Hasilnya memberikan beberapa pertimbangan mendalam tentang pemanfaatan kepercayaan epistemologis untuk meningkatkan interaksi peserta didik dengan konteks sekitarnya untuk mendapatkan kinerja akademik yang optimal.

Kata Kunci: kepercayaan epistemologis, dependen, independen dan gaya belajar

INTRODUCTION

Various studies of psychology and education reveal that the learning style is considered not directly obtained by students from within themselves as it is highly related with cognitive, affective and psychological process (Felder & Silverman, 1988; Reid, 1987; Mayer & Massa, 2003). It means that even though

everyone has feelings, can develop his interests, and has the ability to think, everyone is different from other people's way of feeling, the way he develops his thoughts, the way he determines the development of his personal interests. Likewise, their tendency to choose a learning style obtained during the learning period will be profoundly affected by the learning process and the involvement of academic environment. In this context, students will relate to the external environment such as teachers, partners, and texts as references used in learning.

In addition, students' needs for the environment and their dependence on factors outside them will be strongly related to how they perceive the value of knowledge, the process of knowing, and the use of learning. This relates to the fact that the way a person processes and reacts to different needs that come from outside himself is different from how other people does it. Here, it should be noted that learning is not only solely related to the process at school, but also related to the extent to which students fundamentally believe the knowledge and learning (Muis, 2007; Bendixen, 2002).

Practically, understanding of knowledge will determine the extent to which students depend on the environment, learning style, and personal tendencies and orientation chosen for the success of the study. Students with an understanding that knowledge can be obtained by their own business are more likely to work individually and less dependent on others. Conversely, students with an understanding that knowledge can only be obtained from others or experts with higher knowledge authority will be more likely to be dependent on others and the environment. The first group is called field-independent learners which more tend to be actively involved in teams, work on group assignments and material discussion, and the second group is classified as field-dependent learners, which is is less dependent on teachers and peers, and more competitive in learning activities based on reading and writing (Kienhues, 2015). In short, field-dependent learners are less able to separate the context from the environment, while field-independent learners are better able to separate details from the context of the environment. In this view, they will have a high degree of involvement in the team, intensive interpersonal relationships, and participation in groups in the completion of tasks.

The extent to which students' understanding and belief in knowledge and learning and their effects on the choice of learning styles perceptions about academic achievements are more likely to involve the environment (field-dependent), or focusing on themselves (field independent) has not received much attention from previous studies (e.g Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Higgins, Peterson, Pihl, & Lee, 2007; Rohde & Thompson, 2007).

In the last few decades, predictions of academic success are highly emphasized on cognitive factors such as intelligence and academic ability, although recently, researchers in the field of education and social sciences have realized that non-cognitive factors and skills play an important role in the success and achievement of education (McKenzie & Schweitzer, 2001; Bastian, Burns, & Nettelbeck, 2005; Nasim, Roberts, Harrell, & Young, 2005). It is strongly believed that non-cognitive skills factors are the same or even more important than the cognitive aspects of the education and work process (Khine, 2016).

Furthermore, previous research tends to be more interested in examining aspects of learning styles that are more concrete to be tested empirically, compared to examining the relationship between learning styles and epistemic beliefs (Franzoni, Assar, Defude, & Rojas, 2008; Komarraju, Karau, Schmeck, & Avdic, 2011; Hsieh, Jang, Hwang, & Chen, 2011; Wong & Nunan, 2011). Here, it is assumed that student learning styles are the reflection of students' understanding and beliefs regarding knowledge and learning functions. This is related to the function of learning styles capable of explaining how individuals learn or how each person concentrates on the process, and masters difficult and new information through different perceptions. Style is personal characteristics for each person, and it serves to distinguish one person from another. Thus, in general the learning style is assumed to refer to the personalities, beliefs, choices, and behaviors used by individuals to assist in their learning in a conditioned situation.

Epistemic Beliefs and Learning Style

One important and decisive factor in exposing the use of learning strategies used by students is the students' epistemic beliefs. Huglin (2003) conducted research on personal epistemology with learning styles (feeler, thinker, sensor and intuiter) showed that these four learning styles differ significantly in terms of epistemic beliefs. Hashim, Ramly & Ishak (2009), exploring the relationship between personal epistemology and learning styles mediated by self-efficacy, found that personal belief has a direct and positive effect on learning style. Günes, Bati & Katranci (2017) shows that statistically, significant relationships were found between participants' learning styles and their epistemic outlook. The personality models of field-dependent - field-independent learning style are the derivation of learning style theory (Witkin, Oltman, Raskin, & Karp, 1971). The individual considered as having a field-dependent learning style is when he perceives himself under the influence of the environment. Instead, the individual is considered to have a field-independent learning style when he perceives that most behaviors are not influenced by the environment.

Various studies have shown that epistemic beliefs influence the use of approaches in learning (Cano, 2005; Phan, 2006; Tsai & Chuang, 2005; Bråten & Strømsø, 2005). Educational researchers such as Hofer & Pintrich (1997) claim that epistemic beliefs play an important role in academic behaviors, such as influencing the use of techniques in learning, for example, students who believe that the knowledge structure consists of cut- pieces that are not related to information, are likely to use memorization techniques as a learning technique and not an understanding technique. The study also concludes that students who see equally unchanging and stable knowledge tend to use memorization techniques of scientific facts. In contrast, learners who view knowledge as dynamic will prioritize aspects of information understanding (Davis, 1997). Moreover, students who believe that understanding technique is the best strategy in learning will have better results at the final exam than those who believe that memorizing techniques are the best (Davis, 1997).

Chan (2007) argues that learning behavior is strongly influenced by students' beliefs in the nature of their knowledge and abilities. For field-independent learners, they are not much influenced by authority, social and external figures outside of themselves and more guided by their own needs. Their dominant characteristics are closed nature (introvert), tendency to perform an activity on their own initiative to the best of their abilities (e.g., self-study) even without being motivated or persuaded by the people around them, working regularly and focusing and loving competition. Compared with a field-dependent personality, field-independent individuals have a lower social orientation, (Witkin *et al*., 1971). Witkin *et al*. (1971) also said that individuals with a field-independent learning style have a clear purpose and more freedom to learn.

This study attempts empirically to examine the effect of epistemic beliefs in the forms of belief in knowledge and belief in learning in the choice of learning styles from field-dependent or field-independent. Conceptually, this study adopts the logic theory of contingency, primarily the logic of contradiction, where it is assumed that students with high belief, either in knowledge or in learning, will only have a logical choice regarding the selection of learning styles of field-dependent or field-independent. This model is considered more likely to be able to offer empirical evidence that is more consequent to the learner's belief epistemic level.

METHODS

Research Design

This study seeks to examine the effect of epistemic beliefs on learning styles in students. Regarding the selection of respondents at the tertiary level, and not at the lower levels of the school, this study confirms to test the sustainability of the epistemic belief in learning styles. This is basically the selection of learning styles and beliefs in knowledge and knowing seems to have been formed during the previous education period.

Sampling

Population in this research is all students of study program of Early Childhood Islamic Education, Department of Islamic Education, Kudus State Islamic Institute amounting to 252 students. The selection of students in the Early Childhood Islamic Education program

is because these students become prospective teachers at the initial level of pre-school learning which forms the basis for the development o epistemological beliefs and learning styles for their students. The sampling technique in this study uses Proportional Random Sampling techniques by lottery. In random sampling each class in the population has the opportunity to be sampled. The proportion used to determine the number of samples in each class is 10% of the total number of students of the PIAUD study program. The number of samples obtained was 129 students. The sample distribution using Proportional Random Sampling in each batch can be seen in Table 1.

Table 1. Distribution of Samples

Semester (Admission Year)	Number of Students	Female	Male	Sample
1 (2016)	52	52	0	26
3 (2015)	70	70	0	36
5 (2014)	64	62	2	33
7 (2013)	66	65	1	34
Total	**252**	**249**	**3**	**129**

Research Instruments

The method used to obtain data in this study is a questionnaire or questionnaire, a method based on self-report knowledge in personal beliefs. There are three types of scales, namely the epistemological trust scale, the scale of dependent learning styles and the scale of independent learning styles. Epistemic belief in this research is divided into two components of belief, that are the belief in knowledge and belief in learning. The belief in knowledge (BK) is the individual's belief in the nature of knowledge which includes aspects, such as; (1) knowledge comes from an expert/knowledge expert, (2) certain knowledge, and (3) orderly process.

Field-dependent learning style (FD) is a certain pattern that is stable when the individual accepts, interacts, absorbs, stores, organizes, and processes information with the individual's tendency to look at something globally, makes wide concept distinctions, shows social orientation and sets goals and reinforcement. This variable is expressed using the scale of the field-dependent learning style with the components as characterized by Witkin *et al*. (1971). Furthermore, individuals with a field-independent learning style (FI) have a tendency to look at things analytically, to make certain concepts distinct, to show an impersonal orientation and have their own designed goals. This variable is expressed using a field-independent learning style scale with components as characterized by Witkin *et al*. (1971). The example of item lattice for each variable can be seen in Table 2.

Table 2. Item Grids

Variable	Indicator	Example Item Grids
Belief about knowledge	Certain knowledge	I like classes where the lecturer sets the lecture program before teaching
	Omniscient	The answers in the reference book are helpful as I am not sure of my own solutions
	Simple knowledge	I feel comfortable when faced with uncertain learning conditions
Belief about learning	Innate ability	Students who have moderate achievement during high school will remain the same and have moderate achievements when they become students in Higher Education
	Quick learning	If I can not understand something quickly, I usually have difficulty in learning it as a whole
Field dependent learning style	Viewing matters globally	I don't mind reading or listening without understanding each word as long as I can take the main idea
	Creating wide concept differences	When I study, I prefer simple and general material
	Showing social orientation	I enjoy studying together with friends
	Determine goals and improvements	I need a calm atmosphere in order to concentrate well
Field independent learning style	Viewing matters analytically	If I study, I understand the material in great detail (meticulously to the small things).
	Creating particular concept differences	I have to understand every word of what I hear and read
	Showing impersonal orientation	I like studying alone
	Possessing self designed goals	I finished my job as well as I could before I moved on to finish another task

Data Analysis Technique

The technique used to analyze data in this research was Structural Equation Models or also called Structural Equation Model. As for the needs of analysis, the software program Analysis of Moment Structures (AMOS) was used.

FINDINGS AND DISCUSSION

Findings

The age characteristics of respondents selected as samples of this study ranged from 18 to 26 years old. Almost all respondents were women. The majority of respondents aged between 18-20 years with a total of 91 people or 70.54%. In terms of the semester level, sampling is quite even at all levels of lecture (see Table 3).

Table 3. Respondent Characteristics

Characteristics	Frequency	Percent
Gender		
Female	127	98.45
Male	2	1.55
Age		
18-20	91	70.54
21-25	24	18.60
>26	14	10.85

Descriptive statistics reveals the values of minimum, maximum, and mean and standard deviations for each question item. The mean value for each item ranged in the range of 2.33-3.05, indicating the medium tendency of the sample in the item in question (see Table 4).

Table 4. Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev
Belief in knowledge (BK)				
BK1	1	4	2.65	.669
BK2	1	4	2.71	.687
BK3	1	4	2.83	.601
Belief in learning (BL)				
BL1	1	4	2.40	.701
BL2	1	3	2.33	.700
Field-dependent (FD)				
FD1	1	4	2.81	.808
FD2	1	4	2.84	.755
FD3	1	4	2.52	.708
FD4	1	4	2.81	.751
Field-independent (FI)				
FI1	1	4	2.34	.815
FI2	1	4	3.05	.759
FI3	1	4	2.78	.763
FI4	1	4	2.88	.725

Furthermore, to show how strong the influence between variables is, the correlation test with Pearson technique is done. Pearson correlation test results showed that out of 6 corelations, there were 3 significant correlational relationships between variables. Field-Dependent learning style (FD) is proven statistically to have negative and significant relation with belief in learning (BL) (FD-BL, -.213, significant at .015). The results also show that the Field-Independent Learning variable has a positive and significant correlation in the two exogen constructs of belief in knowledge (FI-BL, .247; .005), and from belief in Learning (FI-BL, .320; .00) (see Table 5).

Table 5. Correlation Matrix of Variables

Parameters	BK	BL	FD	FI
BK	1.00			
BL	.053 (.554)	1.00		
FD	-.088 (.320)	-.213* (.015)	1.00	
FI	.247** (.005)	.328** (.000)	.081 (.359)	1.00

***. Correlation is significant at the .01 level (2-tailed);*
**.05 level (2-tailed).*

Testing with SEM requires a confirmatory test as a means to validate the measurement model of latent constructs (Awang, 2012). The results of the validity test showed that all items had a standardized loading score above .7 as a validity standard. Therefore, all items are declared valid. Moreover, the results of the reliability calculation of the FD learning style scale obtained a value of .71, while the FI learning style gained a reliability score of .74. The results of the reliability of BK gained .91, while BL gained a score of .81. Thus, the entire variables obtain good reliability scores above .70. Thus, all the variables used have met reliability requirements (see Table 6).

Ghozali (2008) and Setiyowati, Pali, Wiyono & Triyono (2019), before the analysis of the model of structural equation as a whole is done, a unidimensionality test on each construct is done with confirmatory factor analysis. This unidimensionality test is conducted to determine whether the constructor measurement indicators have provided reliable results. Unidimensionality test of this research is done by seeing whether

the grain discrimination power (total grain correlation) of construct indicator in this research is significant. The test is also done by looking at the convergent validity or loading factor value of each indicator. Confirmatory analysis is performed between exogenous variables and between indogenous variables. In this model, there are exogenous variables that are epistemic beliefs that consist of belief in knowledge and belief in learning. The indogenous variables consist of two kinds of learning style that is field-dependent and field-independent. The results of confirmatory analysis between exogenous and indogenous variables indicate that the value of fit criteria has been achieved well. Similarly, the significance value of standarized loading parameter estimation is all above .05, so it can be said fit. After several proposed conditions are met, the next step is to test the hypothesis of testing theoretical model data with the overall empirical data.

Table 6. Standarized Loading and Reliability

Variable	Loading Factor	Reliability
Belief about knowledge		.91
Certain knowledge	.81	
Omniscient	.77	
Simple knowledge	.86	
Belief about learning		.81
Innate ability	.94	
Quick learning	.74	
Field dependent learning style		.71
Viewing matters globally	.76	
Creating wide concept differences	.87	
Showing social orientation	.63	
Determine goals and improvements	.75	
Field independent learning style		.74
Viewing matters analytically	.93	
Creating particular concept differences	.88	
Showing impersonal orientation	.77	
Possessing self designed goals	.79	

The results of of analysis of full model on stage 1 the initial structural model analysis showed that Chi-Square 76.527 (DF = 60. p = .074), CMIN/DF = 1.275, GFI = .918, AGFI = .875, TLI = .975 and RMSEA = .046. That the criteria of acceptance requirements of the model can be fulfilled. Based on the result of the significance analysis p = .074 and yet it will try to re-estimate to get better result again. The re-estimation of the model in this study through model modification. Of course modification of the model can still be done provided that the fit model was not found in accordance with empirical data, and as long as it does not deviate from the proposed theory. Modification of the model can be done by modifying the direction of the relationship between variables that already exist in the model, adding or reducing latent variables or observation variables as far as still in the frame of conceptual research support model.

As for model modification analysis in this study is to see the output on Modification Indices (MI) on AMOS 16 analysis that has been done. The output of Modification Indices recommends about the error variables that must be done further to be modified is to connect, e1 with e7, e3 with e6 and e9 with e12. After that the retesting process is done, the results of this re-analysis show an improvement for the Goodness of Fit criteria (see Figure 1).

Based on the retesting process it was found that the criterion requirement improved as the probability result from p = .074 to .155, the GFI value from .918 rose to .926, the AGFI from .875 to .886, the TLI from .975 to .983 and the RMSEA decreased from .046 to .038.

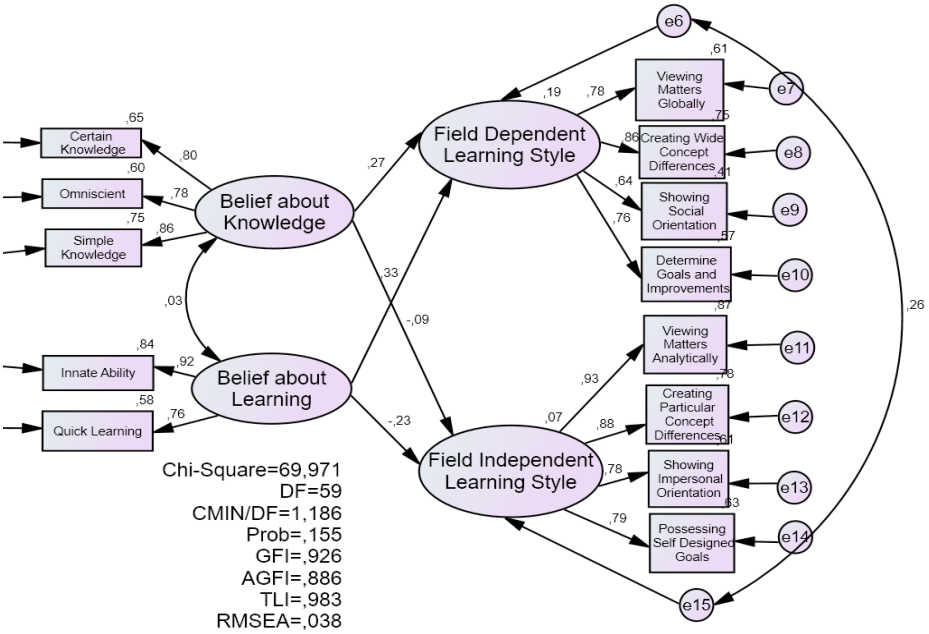

Figure 1. Results of the Modified Indices (MI) Analysis

Thus, the relationship model undergoes improvement (see Figure 1). Thus, it can be stated that the proposed model design does not differ significantly from empirical data. Based on these results then the researchers no longer need to modify the model, so the model can be used in this study. This means the hypothesis that there is a corresponding theoretical model with empirical data is acceptable.

Hypothesis testing is based on the value of estimated loading which is the evaluation of regression weight between latent variables and degree of freedom (*df*), and he critical ratio (C.R) value or t-arithmetic with probability value (*p*) of .05 for the belief level of 95% (Table 7).

Table 7. Regression Weights of the Causality Test

Hypothesis	Sign	Estimate	S.E.	C.R.	*P*	Evaluation
FD ← BK	+ (< .05)	.252	.96	2.617	.009	Accepted
FI BK	- (< .05)	-.119	.124	-.964	.335	Rejected
FD ← BL	+ (< .05)	.267	.105	2.542	.011	Accepted
FI ← BL	- (< .05)	-.259	.107	-2.416	.016	Accepted

Statistical test results show that the belief in knowledge has a positive and significant effect on the field-dependence learning styles, which is indicated by estimate (*r*) .252 C.R value of 2.617 and a significance value (*p*) of .009 < .05. Accordingly, the first hypothesis is accepted. These results reveal that the higher belief in knowledge is more likely to increase learner dependence on the environment. In a related context, these results suggest the possibility that the high level of belief in knowledge will more likely to increase students' interpersonal abilities and improve the capacity of participation in teams and involvement in problem solving.

The next hypothesis attempts to examine the effect of the variable of belief in knowledge on field-independence learning styles. The test results showed *r* = -.964 and C.R value of -.964 with a significance value (*p*) .335> .05. This means that the variable belief in knowledge has a negative effect on field-independence learning styles. Thus, the second hypotsis is rejected. In the affirmative question model, by analyzing the influence of epistemic beliefs on learning styles chosen by students, negative and insignificant results from the variables of belief in knowledge of field-independence learning styles reinforced that students with a high degree

of belief in knowledge were more likely to have field-dependence learning styles as shown by the acceptance of first hypothesis.

The third test is to analyze the influence of belief in learning on field-dependence learning styles. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style, which is indicated by the value of C.R 2.542 and *p* value .011. Then, the third hypothesis is accepted. These results reveal that high belief in learning will tend to make students have a field-dependence learning style. In other words, students will be more intensive in interpersonal relationships and team involvement, compared to solely relying on themselves which is a special characteristic of field-independence learning styles in the learning process.

The next test examined the fourth hypothesis that belief in learning had a negative and significant influence on field-independence learning styles. The test results reveal the value of C.R -2.416 and a significance value of .016. These results demonstrate that students' belief in the importance of learning is negatively related to the likelihood of them choosing the field-dependence learning style. Thus, the fourth hypothesis is accepted. These results affirmatively also confirm the third hypothesis, expressing the tendency of students to become more actively involved in the team and other people, and consider environmental factors, as they increasingly believe in the importance of learning. This is because students are considered to have only one rational choice of the learning style, either field-independence or dependence field. This entire test confirms that students' high belief in the importance of knowledge and intensive learning will be proportionally related to their awareness to involve the environment, peers, and groups, to support the success of their studies.

Discussion

The study showed empirical evidence that the proposed model design does not differ significantly from empirical data. This means the corresponding theoretical model with empirical data is acceptable. The belief in knowledge has a positive and significant effect on the field-dependence learning styles and the variable belief in knowledge has a negative effect on field-independence learning styles but rejected. Statistical test results show that belief in learning has a positive and significant effect on the field-dependence learning style. The belief in learning had a negative and significant influence on field-independence learning styles.

Each individual has its own uniqueness and never two people have the exact same life experience, it is almost certain that the learning style of each person is different from one another. Two individuals who grow up in the same conditions and environment and even though they receive the same treatment will not necessarily have the same understanding of thoughts and views of the world around them. Each has his own perspective on every event he saw and experienced. Learning styles have an important role in the educational process.

Montgomery & Groat (1998) stated that there are several reasons why learning styles need to be noticed in the teaching process. It refers to the process to make the learning process more dialogical, to understand students more differently by adjusting the knowledge base of the learner, the suitability of the task, the main areas, and the careers to suit the personality functions, talents, and to make the teaching process more appreciative of what students already have.

It is called individuals with field dependence learning styles when individuals perceive themselves to be controlled by the environment. As for individuals who have a field independence learning style is when individuals perceive themselves that most behaviors are not influenced by the environment. Some typical characteristics possessed by individuals with field dependence learning styles, are that these individuals have extroverted traits, tend to be motivated from the outside and much influenced by community groups or learning and authority figures, experiencing more global events. (Witkin *et al*., 1971). Individuals with field dependence learning styles like the approach of an 'audience approach' when learning. As for individuals with field independence learning styles have an introverted nature, tend to be motivated from within or self (for example, self-study) and are less affected by social reinforcement, like competition, choose activities, and work structurally and Field-independent personalities have a social orientation lower, compared to field-dependent personalities. Individuals with

field independence learning styles like learning that has clear goals and gives them more freedom of learning (Witkin *et al*., 1971).

Hofer (2002) assert that epistemological beliefs are related to personality. Likewise, Wood & Kardash (2002); Wood, Kitchener, & Jensen (2002) also say that epistemological beliefs are related to personality components, while learning styles are part of personality. According to Garland (1993), the position of epistemological belief determines differences in learning styles such as analytical / serial / field independent / left brained vs. global / holistic / field dependent / right brained learning styles.

Hashim *et al*. (2009) who conducted research on the relationship between personal epistemology and learning styles mediated by self-efficacy which the results showed that personal belief has a positive and direct effect on learning style. An empirical examination from Günes *et al*. (2017) on epistemic views with learning styles in the preparatory program shows that pre-service teachers adopt philosophical skepticism and tends to favor an active learning style, and there is a significant relationship between learning styles and the pre-service teacher's epistemic outlook. The results of this study are also in accordance with Tümkaya (2012) conducted to 246 women and 242 men, a total of 488 students with the results showing that most students have learning styles of assimilation and converging. Moreover, there is no meaningful difference in the sub-dimension of beliefs about learning depends on effort in determining individual learning styles. On the other hand, it shows that in the sub-dimension of belief about learning depends on ability there is one unchanging assumption that is determined by diverging learning style.

Understanding the role of belief in knowledge is important in assisting learners in using effective learning strategies to achieve academic goals. Bråten & Strømsø (2005) find in students, who believe that knowledge is stable and can only be obtained through the teacher's authority, will be less goal-oriented and more oriented to memorizing. Students with low belief or even doubt in knowledge structures such as simple structured knowledge. They will have little or no intrinsic learning orientation, no respect for learning activities, no control over learning and feeling that they can carry out a learning task. Similarly, students' beliefs in the stability of knowledge such as absolute, tentative or transient knowledge and students' beliefs in the source of knowledge that knowledge comes from a more knowledgeable person, from the experience of an authority to convey knowledge or derive from his own thoughts followed by various evidence.

From the results, this study highlights some noticeable findings regarding knowledge, learning style and epistemic beliefs. Knowledge is attributed as certain, absolute, unchanged, and not tentative. Students who have epistemic beliefs with field-dependent learning style tend to believe that knowledge is tentative and unpredictable, and does not believe that knowledge is fixed and immutable (Jehng, Johnson, & Anderson, 1993). Furthermore, knowledge is believed to come from more knowledgeable or authority or expert with superior knowledge such as lecturers or reference books, compared to individual logic and thought. In this dimension, the student does not have a knowledge perspective, thus believing that the information from the reference book is true, and that the teacher must convey the material in the learning process (Jehng *et al*., 1993; Schommer, 1990; 1994).

This is different for students who have more sophisticated epistemic beliefs with field-independent learning style, which emphasize more on the notion that knowledge comes from the constructs of their own thinking. According to Marchant (1992), students are inclined to accept what is delivered by the lecturer. Thus, this condition causes the individual to be very dependent on the environment and in learning to show field-independence. In terms of the orderly process as a contruct for epistemic belief, Jehng *et al*. (1993) explained that the dimensions of a regular process, or so-called rigid learning is the belief dimension of whether learning is a process that the individual passively receives the finished knowledge, or the process of formulating facts in which individuals independently build their ideas. In this dimension, the students' perspective prefers learning by taking the material exactly or in the same way as what they read in reference books and tend to follow what is written there from beginning to end (Jehng *et al*., 1993).

Theoretically, the results of this study are insightful in understanding the influence of epistemic beliefs on knowledge and learning on

learning styles that are very likely to be chosen by students. A high level of belief in learning and learning has a significant relationship with field-dependent learning styles. This implies that students are more likely to involve themselves in the team, discuss learning problems and tasks with partners and teachers, and have more interpersonal relationships with the surrounding context as a result of the increased belief in knowledge and learning. Furthermore, as a consequence of contingency logic, students with field-dependent learning styles are also more likely to reduce or negate the level of belief that knowledge and learning can be obtained from their own abilities.

Empirically, this is evidenced by the negative results and significant influence of beliefs on learning in field-independent learning styles. Practically, this study is useful for teachers and educators in designing learning models, where learning based on individual abilities such as reading and writing will make students more likely be field-independent learners, because of the lack of need for interaction with peers in learning activities. Furthermore, high student belief that academic abilities can only be achieved with the involvement of the surrounding environment will enable them to be active in groups. In this context, learning materials such as discussions and joint assignments will be able to encourage them to strive academically according to their epistemic beliefs.

CONCLUSION

Based on the results of the data analysis and discussion above, the conclusions that can be taken in this study are as follows. 1) That the proposed model design does not differ significantly from empirical data. This means the corresponding theoretical model with empirical data is acceptable. 2) Statistical examination shows the positive and significant effect of exogenous variable in the form of variable of belief in knowledge on field-dependent learning style. However, this variable has no effect on field-independence learning style. 3) The belief in learning had a significant positive effect on the field-dependent learning style and a negative and significant influence on the field-independent learning style. Based on the results of this study it is suggested that educational institutions need to provide and enrich the development of epistemological beliefs in students in order to open opportunities for them to reflect not only on their learning style tendencies, but also about how and why certain learning styles are formed, and more specifically helps them to 'learn how to learn'.

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