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INDONESIAN TEACHER ENGAGEMENT INDEX (ITEI): DECISION SUPPORT SYSTEM FOR EDUCATION

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2017 5th International Conference on Cyber and IT Service Management, CITSM 2017
27 October 2017, Article number 8089321
5th International Conference on Cyber and IT Service Management, CITSM 2017; Convention Hall, STIKOM
BaliDenpasar, Bali; Indonesia; 8 August 2017 through 10 August 2017; Category numberCFP1737Z-PRT; Code 131956

Indonesian teacher engagement index (ITEI): Decision support system for education (Conference Paper)

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Abstract

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Indonesian Teacher Engagement Index (ITEI) is an instrument designed to help teachers to detect themselves through self diagnostic. The results of self-diagnostic is then systemally developed with the goal of becoming a decision support system for the central government to the areas in the field of education. This study aims to develop ITEI design as a Decision Support System in education especially related to teacher engagement. This research uses Neuroresearch method with exploratory research and explanatory research stages at the development stage of IT model. The result of research is 1) construct theoretical construct of ITEI, and 2) design the ITEI model as a Decision Support System through several stages of arrange the Database Design, arrange the Flowchart Responder, Designing the ITEI Model as a Decision Support System and arrange the System Profile Scheme. © 2017 IEEE.

Indexed keywords

Engineering
controlled terms:

Artificial intelligence Education Teaching

Engineering
uncontrolled terms

Central government Database design Development stages Exploratory research
Research stages Self-diagnostics

Engineering main
heading:

Decision support systems

Funding details

Funding text

The authors would like to acknowledgments the ITEI instrument that has been supported by Directorate General of Teachers and Education Personnel, Ministry of Education and Culture of Republic of Indonesia (Kemendikbud).

ISBN: 978-153862737-2

Source Type: Conference
Proceeding

Original language: English

DOI: 10.1109/CITSM.2017.8089321

Document Type: Conference Paper

Sponsors:

Publisher: Institute of Electrical and Electronics
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Indonesian Teacher Engagement Index (ITEI): Decision Support System for Education

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Abstract- Indonesian Teacher Engagement Index (ITEI) is an instrument designed to help teachers to detect themselves through self diagnostic. The results of self-diagnostic is then systemally developed with the goal of becoming a decision support system for the central government to the areas in the field of education. This study aims to develop ITEI design as a Decision Support System in education especially related to teacher engagement. This research uses Neuroresearch method with exploratory research and explanatory research stages at the development stage of IT model. The result of research is 1) construct theoretical construct of ITEI, and 2) design the ITEI model as a Decision Support System through several stages of arrange the Database Design, arrange the Flowchart Responder, Designing the ITEI Model as a Decision Support System and arrange the System Profile Scheme.

I. INTRODUCTION

Entering the era of the 21st century, the demands of higher educational standards that in the end all the educational resources are expected to provide an important contribution for students so that the demand on teachers is increasing [1]. Therefore, the development of teachers is considered important and currently the Indonesian government is trying to improve various programs in order to improve the quality of teachers through performance appraisal, competency test and various other programs [2], [3]. In addition to the programs that have been implemented, it is necessary for a tool that is able to detect themselves by the teacher through self diagnostic.

The Indonesian Teacher Engagement Index (ITEI) is an instrument developed to look at teacher engagement conditions that refer to the five dimensions, namely how teachers are able to show positive psychological conditions, play an active role in building positive education, able to demonstrate good performance, Have a supportive competence, have national character as characteristic of Indonesia and able to show nationalism leadership engagement [2], [4]–[16].

The teacher's self-diagnostic results can illustrate the profiles that governments can use to develop appropriate programs and policies as required by teachers and relevant to education in Indonesia. Implementation of ITEI is done by utilizing technology that allows content to contribute directly on a wider scale [17]. With reference to the concept of self-

diagnostic, ITEI was developed with the aim of being a decision support system for central government to regions in the field of education.

This study focuses on 1) valid and reliable instrument to fill Decision Support System, 2) valid and reliable Decision Support System design. Decision support system is an area of information systems discipline that focuses on efforts to support and improve managerial decisions. This concept has been developed in various fields of science and proved able to provide effective decision support system to various public policies [18]–[20]

II. RESEARCH METHODS

This research uses Neuroresearch method, a mix method that combines qualitative research with exploratory research stages and quantitative research with explanatory research and confirmatory research [21]–[23].

This research uses Neuroresearch method but only until exploratory and explanatory stage. Confirmation stage is not included because the nature of this research is still up to the validity of the instrument and the establishment of self-diagnostic system as a decision support system. Exploratory research stages were performed to find the ITEI construct theoretical instrument with dimensions and indicators capable of measuring the conditions of teacher engagement in accordance with the Indonesian context. Research at this stage was carried out with focus group discussion (FGD) namely theoretical approval and ITEI instrument by involving Directorate General of Teachers and Education Personnel, Ministry of Education and Culture of Republic of Indonesia (Kemendikbud) as a resource for instrument preparation. The technique used is RASCH MODEL and reliability index. Rasch model is a calculation analysis model where the item parameters can be estimated independently of the characteristics of sample calibration parameters [24]–[28].

In determining valid instrument items or drop through RASCH MODEL, set based on Mean Square outfit value (MNSQ), Standardized fit Statistic (ZSTD) and Point Measure Correlation (Pt Mean Corr) value. Valid and drop selection is based on the category "Items are in good condition and do not require any improvement statement statement" ie if the MNSQ value is between 0.5 - 1.5. This MNSQ value is able to determine how well each item contributes to defining a common construction [29]. The ZSTD value is able to show

that the data is considered to have a logical estimate if it has a value ranging from -1.9 - 1.9[30]. While the value of Pt Mean Corr is considered good with a range of values 0.4 - 0.85.

Explanatory research stage is to implement ITEI instrument of exploratory research result into ITEI design as Decision Support System (self-diagnostic ITEI). The way through FGD.

II. RESULT

A. Exploratory Research Results in the form of Construct Theoretical ITEI

Database design is constructed by constructing a questionnaire bundle consisting of questionnaire dimension, questionnaire indicator and questionnaire question. Questionnaire bundle is connected with Kemendikbud user so that automatically the teacher who will fill the questionnaire no need to fill the identity because it is automatically filled in accordance with the data in Kemendikbud.

The results of exploratory research in the form of valid ITEI Instrument content validity through FGD 165 points consisting of 6 dimensions, namely Positive Psychology, Positive Education, Good Performance, Indonesian Teacher Competences, Nationality Characteristics and Nationalism Leadership Engagement.

Positive Psychology dimension has 6 indicators, namely 1) Wisdom and Knowledge, a cognitive strengths that entail the acquisition and use of knowledge consisting of creativity, curiosity, open mindedness, love of learning and perspective; 2) Courage, an emotional strengths that consist of authenticity, bravery, persistence and zest; 3) Humanity, an interpersonal strengths that involve (tending and befriending) others consisting of kindness, love and social intelligence; 4) Justice, a civic strengths that underlie healthy community life consisting of fairness, leadership and teamwork; 5) Temperance, a strengths that protect against excess consisting of forgiveness, modesty, prudence, self regulation; And 6) Transcendence, a strengths that forge connections to the larger universe and provide meaning consisting of appreciation of beauty and excellence, gratitude, hope, humor and religiousness [9], [10]

Positive Education dimension consists of six indicators, namely 1) Positive Emotion, a positive emotional experience such as joy, gratitude and hope; 2) Positive Engagement, eg interest, engagement, curiosity and absorption; 3) Positive Accomplishment, an incentive to achieve meaningful results; 4) Positive Purpose, where teachers are able to contribute to others and to the community; 5) Positive Relationships related to social and emotional skills to encourage the establishment of positive relationships; And 6) Positive Health, a healthy and optimal physical and psychological condition [8]

Dimensions of Good Performance consists of four indicators, namely 1) Task Performance, where teachers are able to perform the main duties and responsibilities as teachers; 2) Contextual Performance, in which uru is able to exhibit positive behaviors that support the effectiveness of performance; 3) Counterproductive Work Behavior, where

teachers are able to minimize behaviors that reduce the effectiveness of performance as well as 4) Adaptive Performance, where teachers are able to adapt and proactive with changes [6], [7], [16], [31], [32]

The Indonesian Teacher Competences dimension consists of four indicators: pedagogic competence, social competence, personal competence and professional competence [15]

Character Dimension Nationality consists of five indicators namely 1) Character of Godhead; 2) Fair and Civilized Humanitarian Character; 3) Character of Unity of Indonesia; 4) People Character Led by Wisdom of Wisdom and 5) Character of Social Justice.

Dimensions of Nationalism Leadership Engagement consists of seven indicators: 1) Able to identify himself as an educator who has a leadership spirit that represents the interests of Indonesia as a whole; 2) Have a positive perception of the region as well as Indonesia that Bhineka Tunggal Ika as its own machine to fight for the integrity of Indonesia; 3) Demonstrate as a trustworthy educator; 4) Have competence in managing multiethnic students; 5) Able to be an example in developing the paradigm of students in seeing its area as an integral part of Indonesia; 6) Able to motivate students to prioritize national interests; And 7) Creative and innovative in winning problems with the principle of national stability.

ITEI instrument reliability test results consisting of 165 items indicate that the reliability of the items in the good category is 0.90.

Person	672	INPUT	672	MEASURED		INFIT	OUTFIT				
TOTAL	600.5	COOK	165.0	MEASURE	REASE	1.05	2STD	0.00	2STD		
MEAN	24.9			2.27	.16			1.00	-.01		
S.D.				.53	.05	.21	1.2	.27	1.31		
REAL		RMSE	.17	TRUE	SD	.50	SEPARATION	2.95	Person	RELIABILITY	.90

Item	165	INPUT	165	MEASURED		INFIT	OUTFIT				
TOTAL	2478.2	COOK	672.0	MEASURE	REASE	1.01	2STD	0.00	2STD		
MEAN	151.5			.57	.02	.24	0.2	.34	0.51		
S.D.				.57	.02	.24	0.2	.34	0.51		
REAL		RMSE	.00	TRUE	SD	.57	SEPARATION	6.76	Item	RELIABILITY	.90

Figure 1. ITEI Instrument Reliability Test

B. Explanatory Research Results

The results of the explanatory research in the form of Decision Support System design for ITEI which has been validated through FGD together with the Directorate General of Teachers and Education Personnel of the Ministry of Education and Culture of the Republic of Indonesia covers several stages:

a. Arrange Database Design

In the first phase, the design of ITEI model was started by compiling ITEI Database Design which will systematically describe ITEI dimension, indicator, and item as well as a demographic picture of a respondent. ITEI Database Design consists of 1) questionnaire bundle containing questionnaire dimension, questionnaire indicator, and questionnaire question; 2) responder header which includes user agent information, ip address information and kemendikbud user. The entire ITEI Database Design is described as follows:

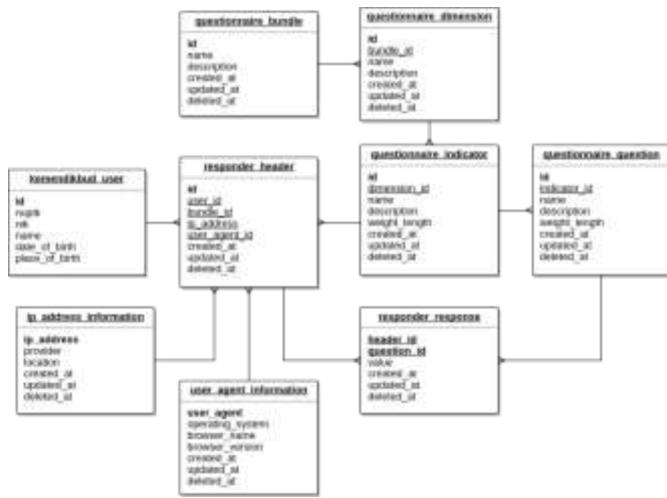


Figure 2. ITEI Database Design

b. Arrange Flowchart Responder

In the second stage, the design of ITEI model is done by arranging Flowchart Responder. The ITEI instrument will be filled simultaneously throughout Indonesia so that all teachers in Indonesia who have NUPTK are required to complete this instrument. The instrument filling procedure begins by logging into Kemendikbud website, ie gtk.data.kemendikbud.go.id. The website will automatically perform user validation. Once the identity is validated, the user can perform the charging to the instrument online.

The fully populated instrument will go into the database and generate an individual profile and the system will automatically store the information.

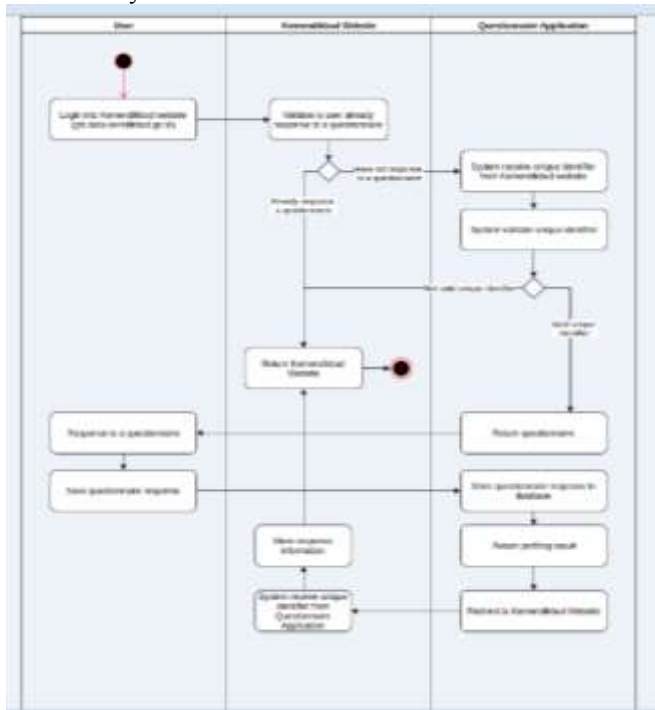


Figure 3. Flowchart Responder

c. Design ITEI Model as a Decision Support System

The three stages above produce Design Build ITEI Model with the picture as follows:

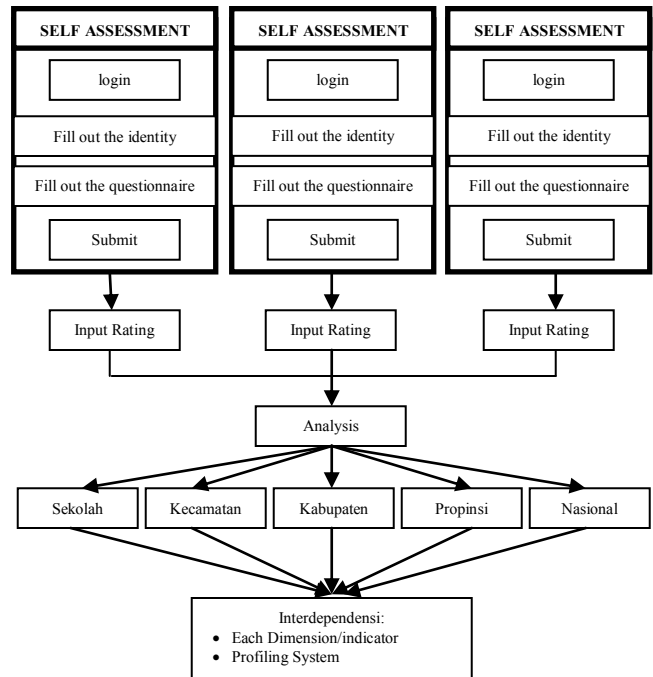


Figure 4. Design ITEI Model as a Decision Support System

d. Arrange Profiling System

In the third stage, the design of the ITEI model is done by compiling the System Profile Scheme. When all data has been collected, the system will automatically generate profiling of all responders whose data has been entered and will automatically generate the conditions from the trend of existing engagement conditions. These trends and mappings will relate to each dimension and indicator so that the resulting profile will be more specific.

Currently the system is also developed to be able to generate personal profile so that automatically each user is also able to see the type of intervention necessary to improve engagement in accordance with the dimensions and indicators required.

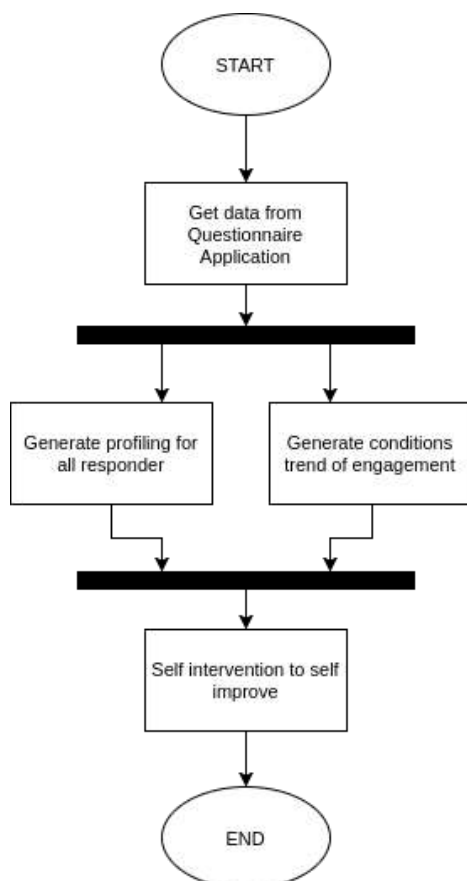


Figure 4. Profiling System

III. CONCLUSION

ITEI instrument is valid and reliable in measuring teacher engagement with Indonesian context so that it can become self assessment which integratively able to map the condition of teacher engagement per individual, school, sub-district, district, province and even national.

With this concept, the government, especially Kemendikbud can monitor the condition of the teacher with up to date. Proper profiling and design of interventions will help governments implement appropriate programs to suit the needs of teachers in different parts of Indonesia.

This study is still continuing with national sample testing so that the standard instrument design as a decision support system will be more reliable so that the third stage in neuroresearch that is confirmatory stage can be fulfilled.

Continuous testing needs to be done considering Indonesia has a high diversity. So the instrument must be able to measure the conditions and competences are diverse.

ACKNOWLEDGMENTS

The authors would like to acknowledgments the ITEI instrument that has been supported by Directorate General of Teachers and Education Personnel, Ministry of Education and Culture of Republic of Indonesia (Kemendikbud).

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