

ANALYZING THE FACTORS THAT AFFECT THE OBJECTIVES OF PRE-SERVICE TEACHERS TO PERFORM LABORATORY PRACTICE IN SCIENCE LESSONS BY MEANS OF THE THEORY OF PLANNED BEHAVIOR

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ABSTRACT

Science lesson can be carried out in many settings both in classroom and out of classroom. Laboratory practice is usually carried out in laboratories out of the classroom or when necessary in the classroom. It is a necessity for science lessons because of the nature of science.

The aim of this study is, by using The Theory of Planned Behavior (TPB), to determine the objectives of pre-service Science teachers towards performing laboratory practices in Science lessons in the future.

In the study, to confirm the factors that affect the objective towards behavior, Relational Screening Model was used. As an assesment instrument, the scale consisting of 54 items which is in accordance with the Theory of Planned Behavior and which was developed by the researcher was used. Sample study group consisted of pre-service science teachers and primary education teachers from Kastamonu University and Zonguldak Bülent Ecevit University.

In the consequence of the study, it was confirmed that pre-service teachers' objective towards laboratory practice was generally affected by their attitude and this was analyzed considering the sights of the Theory of Planned Behavior.

INTRODUCTION

Laboratory practice is one of the most important parts of Science lesson. Without laboratory practice, Science lesson cannot be effective. It is a lesson which can be carried out both in classroom, laboratory and out of the school because of its nature.

Science laboratory is the place where the subject is taught artificially with the help of experiments or demonstrations. The existence of laboratories in schools is an efficient factor for the education. The basic philosophy of laboratory based teaching is doing experiment and observing the results (Ekici et all. 2002).

There are a lot of factors which affect laboratory practice. The physical condition of the school may be insufficient, the necessary materials may not be available. Teachers may regard laboratory as a burden, they may have difficulties in performing laboratory experiments or they may feel under pressure because of parents and school administration.

As it is not possible to test the behavior directly, with the help of The Theory of Planned Behavior (TPB), the factors which affect the behavior are found out and to what extent the behavior will be performed is predicted. In order for the behavior to be performed, there should be an objective. And the objective is affected by attitude towards the behavior, subjective norms and perceived behavior control. Planned Behavior Theory has been developed to test the factors affecting the behavior and to identify the possibility of being performed (Karademir, 2013; Ajzen, 2002; Ajzen 1977).

THE STUDY

The aim of the study is to determine the objective of pre-service teachers towards Science laboratory experiments, their attitude towards behavior, objective norms and perceived behavior control variables. Sample of study group consists of 3rd and 4th grade 238 pre-service teachers from Science and Primary Education departments in Kastamonu University and Zonguldak Bülent Ecevit University.

Relational screening model was used in the research. In order to collect data, in accordance with Planned Behavior Theory, the scale developed by the researcher consisting of 54 items with seven point likert was used. The Cronbach's Alpha of the scale was found 0,923, KMO was 0,907.

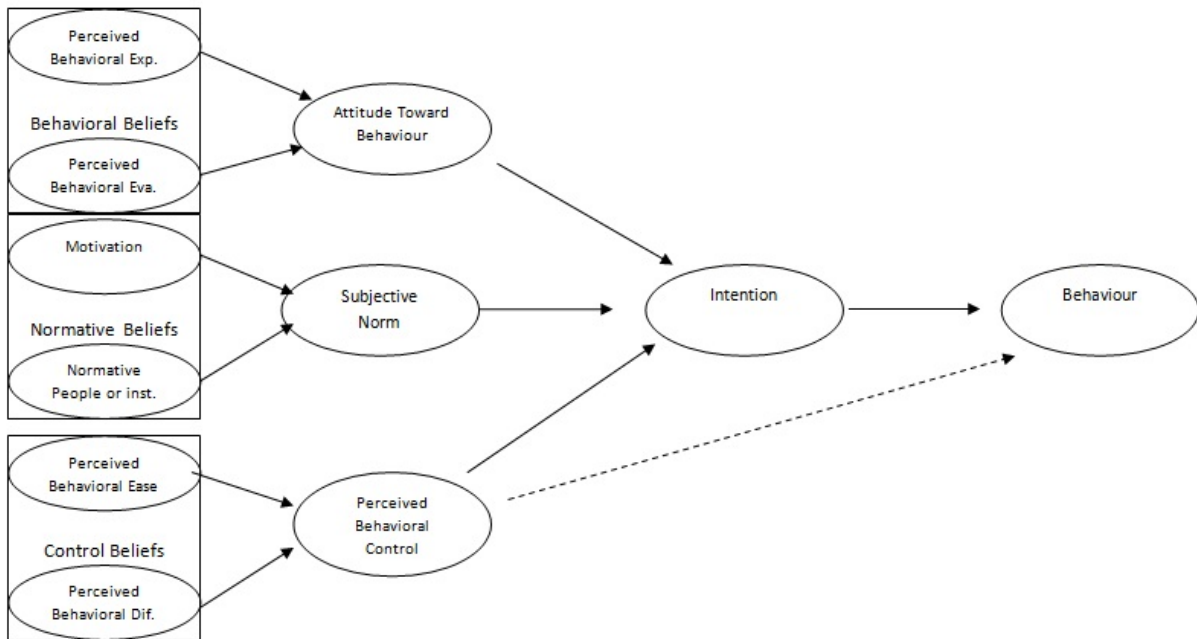


Figure 1. The theory of planned behaviour model (Erten, 2000)

FINDINGS

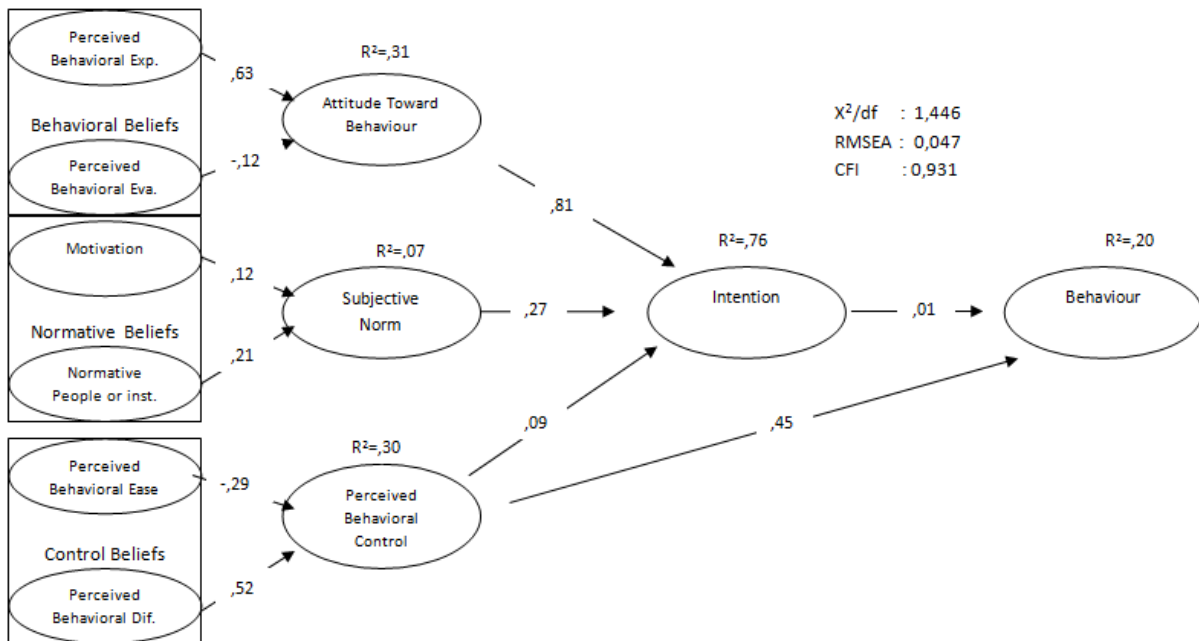


Figure 2. Pre-service teachers' structural equation model findings

As seen in the Figure 2, the fit indices are very suitable

Based on the obtained data,

- *Attitude Towards Behavior* is explained at moderate level by behavioral belief [$R^2: .31$].
- *Subjective Norm* is explained at low level by normative belief [$R^2: .07$].
- *Perceived Behavior Control* is explained at middle level by control beliefs [$R^2: .30$].
- *Attitude Towards Behavior* has a high relationship with *Perceived Behavior Expectations* [$r=0,63$].

- Subjective Norm has a low relationship with *Normative Beliefs*
- Perceived Behavior Control has a high relationship with *Perceived Behavior Difficulty* [r=0,52].

When the intention is analyzed

- Perceived behavior control, subjective norm and attitude towards behavior explain the 76% of the objective [R²: ,76].
- Based on the findings, the highest explanatory of the objective is attitude towards behavior and the lowest one is perceived behavior control.
- So, the objective of pre-service teachers towards performing laboratory experiments is mostly affected by their attitude towards behavior. It means, pre-service teachers aim at performing laboratory experiments mostly because of the results of the practice.
- The subjective norms of pre-service teachers affect their objective towards behavior to some extent. It means, pre-service teachers may perform the laboratory experiments because they may feel under pressure of some people or administration.
- The objective of pre-service teachers is affected by the perceived behavior control to the least extent.

Perceived behavior control;

- While perceived behavior control effect the objective towards behavior, it also has a great impact on that behavior. [r: 0.45].
- While perceived behavior control has a high relationship with perceived difficulty [r: 0.52], it has a negative low relationship with perceived behavior ease [r: -0.29].
- So, it means that pre-service teachers think the conditions of laboratory practice may be difficult and that feeling of the difficulty effects their laboratory practice behavior.

When we analyze the items of scale;

- Attitude towards behavior sight has a high relationship with the items;
 - o It is important to me if the students are more interested in the lesson [r: 0.881]
 - o Laboratory experiments make the lesson more enjoyable [r: 0.864]
 - o Students find an opportunity to make observation [r: 0.860]
- At the subjective norm sight;
 - o Pre-service teachers mostly express that they may feel a pressure mostly by the Ministry of National Education [r: 0.827]
 - o Pre-service teachers express that the most important thing for them is the laboratory practice expectation of school administration [r: 0.939]. Then, their colleagues' expectations are important [r: 0.840], and later the Ministry of National Education 's expectations are important [r: 0.836]
- Perceived behavior control sight has a high relationship with the items;
 - o It will be difficult because of the unsuitable physical condition of the school [r: 0.889]
 - o It will be difficult because the classrooms are crowded [r: 0.840]
 - o As the materials are not interesting, it will be difficult [r: 0.858].

RESULTS

As a result, the most efficient factor that affects the laboratory practice objective of pre-service teachers is the attitude towards laboratory practice. The meaning of why the effect of attitude towards the objective of the behavior is [0,81]: If the pre-service teachers find the laboratory practice better, they will most probably aim at performing laboratory practice. The effect of the attitude towards the behavior shows that it is not the people or the administration, but the attitude itself.

It is confirmed that the subjective norms of the pre-service teachers affect their objective at a low level. The pre-service teachers expressed that mostly the Ministry of National Education expect them to perform laboratory practice, but the expectations of school administration and the colleagues are more important for them. So, it can be stated that school administrations should take responsibility for performing laboratory practice. School administration and other teachers should encourage science teachers in laboratory practice. According to the result of the research, pre-service teachers care about mostly the administration and the other teachers.

While the perceived behavior control of pre-service teachers effect the objective towards behavior at a low level, it affects the direct behavior at a moderate level. Therefore, if pre-service teachers think they will encounter

some difficulties in laboratory because of the crowded classrooms and unsuitable physical situation of the schools, it is probable that they will have prejudice against laboratory practice.

For an efficient science lesson, the physical situation of the schools should be improved and the classroom size should be at a suitable level.

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