



Correct the Deficiency of Pre-service Physics Teachers' Knowledge with Differentiated Instruction

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Differentiated instruction (DI) is developed by Tomlinson. In DI, different educational environments introduce to students for learning. Various choices are offered to students for make their own chooses. Because of that instructions are designed as providing students' requirements.

In this research, pre-service physics teachers' lack of knowledge was determined and then this deficiency was attempted to eliminate with using DI. Twenty six pre-service physics teachers were participated to research. In this research, pre-experimental quantitative research method was used. A multiple choice test about optics (MCTO) was used for both pre-test and post-test which includes 39 questions. Three multiple-choice questions were asked for each educational objective to pre-service physics teachers in MCTO. Thirteen educational objectives were selected which are been found in curriculum of 10th grade (14-15 years) Turkish high school. For determine participants' lack of knowledge about optics, MCTO was asked to them. If a participant answered wrong any of three questions about one objective, participant was accepted lack of knowledge about that objective. In this way, deficiency of all participants about optics was determined. And then, literacy activities were designated individually according to their deficiency. Participants practiced their tasks under researcher supervision during three weeks and three hours a week. MCTO was applied both before and after intervention. In the study, gathered data from MCTO were analyzed with statistical package program which is called SPSS. Before teaching, MCTO was implemented to pre-service teachers as pretest. Right after teaching with DI, MCTO was implemented to them again as posttest. Dependent samples t-test was applied for testing effectiveness of DI. There were significance difference between scores of pretest and posttest ($t_{25}=2.86$; $p<.05$). When we interpret outcomes of t-test, we could say DI is an effective method to correct the deficiency of pre-service physics teachers' knowledge about optics. We could say that each participant was educated in accordance with him/her requirements. If you prefer another teaching method for teaching 13 educational objectives, it could take minimum 10 weeks. So that, DI may be useful for correct the deficiency of students who learned any subject before incompletely.