



A qualitative study on teacher perspectives: Special Relativity in high school physics

Eric Gibbings, Manjula Sharma, and Ian Sefton, School of Physics, University of Sydney, Australia egibbings@bigpond.com, sharma@physics.usyd.edu.au, I.Sefton@physics.edu.au

Abstract: *The literature suggests that developing an understanding of abstract concepts proves to be difficult for many students. These difficulties subsequently pose challenges to teachers as they work to convey abstract subject matter. Piaget proposed that learners proceed from a concrete understanding of phenomena through to an ability think in an abstract, formal and logical manner in a series of cognitive developmental stages. Building on Piagetian ideas, constructivist approaches to learning incorporate considerations of prior knowledge and experiential learning. In the teaching of high school Physics there is much abstract subject matter presented that is not related directly to experiential learning. The teaching of Special Relativity in New South Wales high schools is the focus of this study. Special Relativity is regarded as one of the most important and fundamental theories in modern Physics and yet there is not much research into student understandings of Special Relativity. The concept involves unique features such as the use of thought experiments and the difficulties in providing supporting empirical evidence. There are inconsistencies in how the topic is presented in differing educational contexts. Hence there is a need investigate how Special Relativity is taught in the high school classroom.*

The aim of our research is to explore the perspectives that NSW teachers have on their teaching of Special Relativity. The paper presents preliminary results of the research which consisted of a written qualitative survey and video interviews. The survey was completed by seven teachers and in-depth interviews were conducted with a further three teachers. They responded to questions that endeavoured to explore what skills, characteristics and attitudes they were seeking to instill in their students, what pedagogical methods they used to promote those attributes in the students, to what extent do they sought to relate the theory to real phenomena, what manner of questions do they used in teaching and assessing and whether they anchored the questions in reality.