

# A causal model of factors affecting azimuth and altitude learning by smart phone in astronomy

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**Abstract.** In present, physics learning management has developed into learning technology from easy to complex levels with many developed media increased. Smart phone is one of all media use in many automatically. In this paper, researcher used instruction of a causal model of factor affecting azimuth and altitude learning by smart phone in astronomy using by rotating the position, finding the angle of the star in the sky which tells the coordinates of the star from applications created used by cell phones and Wi-Fi. It was suggested that student using their phones to download a free app that would monitor frequencies and send data to a processing facility. Methods for teaching and learning that students have analysed solve problems that are linked to the problems of everyday situations and conclusions through the team's idea to solving problems of inequality in access to quality education of students who are far away and the practice of research practices that can be used to develop educational institutions. The results indicated that the adjusted model was consistent with empirical data. Goodness of fit measures were found to be:  $\chi^2 = 271.59$ ,  $df = 149$ ,  $p\text{-value} = 0.00063$ ,  $GFI = 0.95$ ,  $RMSEA = 0.042$ .

## 1. Introduction

Department of General Science, Faculty of Education, Bansomdejchaopraya Rajabhat University realize and aim to promote student potential to capacity of experience and integrated with technology digital (smartphone) for better than convenience of learning. About the inclusion of Learning within a formal learning environments, teacher involvement occupies a fundamental position as has been analyzed in recent works [1]. Concerning physics learning, mobile devices are not only mere intermediate tools between the learner and the teacher or the available contents. Smartphones can also be used for learning physics by allowing the students to do experiments using the smartphones' sensors as measurement devices. [2]. The more interesting result is that a majority of students see mLearning as a very positive experience as they would recommend it (average value at 3.30 of Likert scale) or use again this type of applications (average result). It was also interesting to see their positive opinion on mLearning, as they considered that it facilitates learning (average value 3.5). More details on the results of this survey can be seen elsewhere [3]. We must only provide them with tools that can be used not only to observe, but also to measure so that they can make a more critical thinking to contrast or reassure their knowledge of physics.

Currently most of our students have smartphones that can be used with that aim. Many recent works have shown the utility of free applications that access the smartphones sensors to record measurements of physical quantities in several fields of physics, as mechanics [4]. In science learning, most require visual media or supporting tools to facilitate the understanding of the material especially for materials related to natural phenomena [5]. The practice of pocket mobile learning media can influence the



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