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# A Factor Analysis of Competencies in Information and Communication Technology of Science Teachers Under The Uthaithani Primary Educational Service Area Office

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## Abstract

*This study aimed to analyse the confirmatory factor structure of information and communication technology (ICT) competency among science teachers under the Uthai Thani Primary Educational Service Area Office. A quantitative research methodology was used. The sample comprised 500 science teachers selected through multistage sampling. The researcher developed a 77-item instrument using a five-point Likert rating scale. The instrument was validated by experts for content validity, and the content validity ratios for individual items ranged from 0.60 to 1.00, with item discrimination indices ranging from 0.44–0.92. The reliability coefficients, calculated using Cronbach's alpha, ranged from 0.97–0.99. Data were analysed using confirmatory factor analysis (CFA) through statistical software, which indicated that the model demonstrated a good fit with the empirical data. The chi-square statistic was 107.331 with 98 degrees of freedom ( $p = 0.244$ ), indicating good fit. The fit indices also indicated an excellent model fit, with a Tucker-Lewis Index (TLI) of 0.998, a Comparative Fit Index (CFI) of 0.999, a standardised root mean square residual (SRMR) of 0.022, and a Root Mean Square Error of Approximation (RMSEA) of 0.015. Among the factors, the highest factor loading was found in the knowledge component (0.940), followed by the skills component (0.896) and the attitude component (0.708), all of which were statistically significant at the .01 level. Future research should test the model in other contextually diverse regions and across different grade levels and investigate emerging variables relevant to contemporary ICT competencies.*

**Keywords:** Competency, Information and Communication Technology, Science Teachers, Confirmatory Factor Analysis, Primary Education, Thailand Teacher, ICT Skill

## Introduction

The Digital Revolution has brought about significant transformations during the Fourth Industrial Revolution, in which Information and Communication Technology (ICT) plays a critical role across all dimensions of the global economy, society, and education. Nations worldwide are facing borderless and liberalised competition, particularly with the emergence of the Internet of Things (IoT), where devices can easily and rapidly connect to the Internet. Consequently, the number of Internet users has been increasing continuously and is expected to rise even further in the future (ITU, 2021). In response, Thailand has adopted the Thailand 4.0 policy to enhance its citizens' capacity to access information and boundless learning resources and to foster knowledge development and the creation of innovations that address national demands. This policy emphasises flexible and diversified curricula and educational management aligned with 21st-century skills, as outlined in the National Education Plan (2017–2036), which aims to develop learners with 3Rs—Reading, Writing, and Arithmetic