

The Impact of ICT and Travel Behavior

Nurul Hasanah Abdul Satar

Universiti Teknologi Mara, UiTM Cawangan Selangor, Puncak Alam, 42300,
MALAYSIA

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Abstract: People travel to various locations and times of the day to perform various activities. People have virtual access to a wide range of investigates that includes travelling. The application of information and communication technology (ICT), which eliminates the need for physical travel and thus reduces traffic congestion. This paper investigates the extent to which Malaysian tourists' dwellers participated in travel activities via mobile phone or internet, as well as the impact of ICT usage in travelling activities. To determine the relationship between ICT and observed travel patterns, structural equation models were developed. According to the model results, facilitating more leisure activities.

Keywords: ICT, Technology, Travel Behavior, Innovation, Tourists, Travelling

1. Introduction

Information and communication technology (ICT) gives users virtual access to a variety of activities (also known as tele-activities or e-activities), such as e-reading, e-shopping, and bill paying. This helps to relieve traffic congestion. It is impossible to evaluate accessibility only in terms of cost, distance, or journey time [1]. The impact of ICT technology on personal activities and related travel has been extensively discussed in the transportation literature since 1980 [2]. Telecommuting was the main topic of many earlier studies on tele-activities. The literature has paid less attention to tele-shopping, tele-leisure, and a variety of other personal maintenance activities like telebanking, e-payment, and e-booking. The interaction of ICT with transportation, according to the research, can lead to several changes in activity-travel patterns, including substitution, generation, and modification [3]. Out of the four main direct effects of ICT on travel, substitution and complementarity for tele-shopping and tele-leisure are the most common. ICT is being used more and more for maintenance tasks like banking (tele-banking), medicine (tele-medicine), dealings with the government (like paying taxes), and other private business [1]. Studies on telemedicine and telebanking report reduced travel, but few of these studies point to substitution effects [4]. The connection between ICT and gender disparities in activity-travel behaviors piqued the interest of many researchers [5].

*Corresponding author: nurul.hasanahsatar@gmail.com

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2. Materials and Methods

This study's main objective is to evaluate the relationship between ICT and tourists from Malaysia's travel habits. In the analysis, structural equation modelling is used (SEM). SEM is frequently employed in several research to evaluate the impact of ICT on activity and travel behaviour because it can measure the correlations between ICT, sociodemographics, and participation in virtual and physical activity [6]. The fact that SEM may be used to investigate the relationships between latent constructs that are represented by a variety of observed measures is one of its main advantages over other analysis approaches. The SEM analysis employs both a structural model and a measurement model.

$$\text{Structural equation: } \eta = \beta\eta + \Gamma x + \zeta \quad (1)$$

$$\text{Measurement equation: } y = \Lambda\eta + \epsilon \quad (2)$$

Where

η = m x 1 vector of latent endogenous variables

x = q x 1 vector of observed exogenous variables

y = p x 1 vector of observed endogenous variables

ζ = m x 1 vector of error terms associated with the latent variables

ϵ = p x 1 vector of measurement errors

β = (m x m) coefficient matrix showing the direct effects between each pair of the m latent variables

Γ = (m x q) coefficient matrix for the regression effects of x on η and

Λ = (m x p) matrix of coefficients in the measurement model relating the latent variable constructs and the observed endogenous variables

In the measurement model, latent variables' indicators are used to explain them (observed variables). The structural model accounts for both the regression impacts of endogenous factors on other endogenous variables on endogenous variables as well as the regression effects of exogenous (independent) variables on endogenous (dependent) variables. Maximum likelihood estimation is used for coefficient estimation. A structural equation model is made with the aid of statistical analysis software. An overview of the modified model created for this study is shown in **Figure 1**.



Figure 1: Adapted SEM model structure

3. Results and Discussion

The results of the model estimation are shown in **Table 1** and **Table 2**. The model's output is compared to various goodness-of-fit metrics, including the Comparative Fit Index (CFI) score of 0.911 (> 0.9), the Goodness of Fit Index (GFI) score of 0.935 (> 0.9), the Normed Fit Index (NFI) score of 0.903 (> 0.9), and the Root Mean Square Error (RMSE) score of 0.06. The model works reasonably

well, according to the figures that were previously supplied. Table 1 displays the standardised parameter estimates, t-values, and observed indicators that were used to create the latent variable "ICT."

Table 1: Standardized parameter estimate for latent variable "ICT"

Indicators	Estimate	t-statistics
Number of mobile Phones	.74*	0.000
Internet speed used	.81	6.3
Internet experience in number of years	.79	7.0

All the observed indicators for the latent variables function satisfactorily, according to the t-statistic values displayed in **Table 1**. Internet speed and expertise are significant factors in explaining ICT usage, in addition to owning mobile phones. Internet connection parameters and consumer technological experience are significant predictors of e-activities [7].

Table 2: Total and direct effects between endogenous variables in standardized coefficients

Variables	Travel variables	Telecommunication Variable
	Total Trips	ICT
Travel behaviour		
Total Trips		0.22
Total		0.65
Direct Effect		
Telecommunication variables		
ICT		
Total	0.052	
Direct Effect	0.071	

The aggregate and causal impacts of external factors on endogenous components are shown in **Table 2**. The development of digital technologies has been linked to improvements in travel behaviors. Despite being the main provider of income, the responder places a high importance on travel. When one's financial condition improves, they are more likely than individuals with fewer means to engage in a larger range of activities [12]. Compared to when they had to pay for it themselves, employees who have access to the internet at work can save a significant amount of time. Among older people, there is a decline in travel.

4. Conclusion

This study examined the connection between ICT and individual travel behaviour using information gathered from Malaysian tourists. The results of the modified model show that ICT encourages additional leisure activities and raises an individual's overall travel volume. The responder likes to conduct e-activities like e-maintenance and e-shopping if they are the head of the home. The use of ICT is negatively impacted by the presence of older family members at home. In order to forecast travel demand, future research will focus on quantifying the effect of ICT on time use for leisure and maintenance activities, shopping, and related travel.

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