Career Awareness, Skills and Acceptance of Multimedia in Teaching and Learning, Malaysia: An Expansion of the UTAUT Model

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Abstract: Various information communication and technology (ICT) are used in teaching, learning and research collaborations in the higher learning institutions for the human capital development. Using the extended Unified Theory of Acceptance and Use of Technology (UTAUT) model, this paper aims to examine the determinants of the acceptance on the use of multimedia in learning among graduates who took economics related subjects in UiTM Cawangan Sarawak. The data was analysed using Partial Least Square (PLS) and Structural Equation Modelling (SEM). Our results show that out of five constructs, the new variable, namely career awareness, had the largest effect on the behavioural intention of using multimedia in learning among students. The moderating variables such as gender and age did not have any influence, while hard skills and soft skills had influence on the behavior of students. Several policies are recommended to further improve the determinants of the acceptance on the use of multimedia in the higher learning institutions.

Keywords: Career awareness, UTAUT model, PLS-SEM, hard skills, soft skills

INTRODUCTION

The information communication and technology (ICT) are used extensively in teaching, learning and research collaborations in the higher learning institutions worldwide. In particular, instructors and university students use ICT on a daily basis to engage in innovative teaching and learning methods, which are essential in nurturing and developing human capital (Ting et al., 2021, 2020). Among others, these include virtual classroom, mobile learning application, Moodle learning management system, blogs, social networks, WhatsApp, webinar system, online learning, and digital technologies (Sari et al, 2022; Yeboah and Nyagorme, 2022).

The empirical findings on the acceptance of the use of ICT in teaching and learning are very positive, where ICT has become common practice in higher learning institutions. However, there are several challenges of teaching and learning faced by the various stakeholders of universities in Malaysia. Firstly, there is skill requirement mismatch between employers and university students in the labour market especially after the evolution of the Industrial Revolution 4.0 (Rodzalan et al., 2022). Employers often discover insufficient soft skills among university graduates (Sujova et al., 2021). In recent decades, employers seek after university graduates that demonstrate both hard skills and soft skills at the workplace.

Secondly, the use of ICT has become every part of the academic assessment in the higher learning institutions worldwide. The government and university have invested heavily on the ICT for the human capital development. The ICT are used in online teaching and learning activities such as conducting lectures and meetings, doing academic assessments such as examination and grading, and conducting research and attending online conferences. Nonetheless, there are various report of issues and challenges on the use of ICT in universities such as lack of management, dilapidated infrastructures, and limited fundings (Sirat and Wan, 2022; Yeap et al., 2021).

Thirdly, career awareness motives and drives undergraduates to explore various innovations and creativity in their studies. Scholars discover

that undergraduates could re-orient or change their career choices if undergraduates have better command of ICT (Bennett et al., 2021; Tsakissiris and Grant-Smith, 2021). In addition, many undergraduates are reported as not having good career awareness especially in developing countries, due to various factors such as low students' abilities and career aspirations, limited use of ICT, restricted cultural values, poor career guidance, limited parental support and other environmental factors (Bennett et al., 2021; Qiu et al., 2017). These factors restrain career awareness and motivation toward career choice after graduation by university students.

There is burgeoning literature of the use of ICT on teaching and learning in higher learning institutions in Malaysia. Among others, these empirical studies focus on the Google classroom (Sari et al., 2022), online learning (Yunus et al. (2021)) and augmented reality (Nizar et al., 2019). These empirical studies are conducted for various academic subjects and generated mixed findings. Ting et al. (2022, 2021, 2020) conducted a serial of empirical studies in Malaysia on the innovative teaching and learning methods in economics related subjects. However, the above existing empirical studies in Malaysia do not incorporate career awareness, hard skills and soft skills-all of which are important elements that motivate students in their learning activities.

Thus, this study further expands the existing literature by focusing on the determinants of the acceptance of ICT on the learning experience in a specific subject, namely economics. In particular, the objective of this paper is to examine the factors that influence the acceptance of use of multimedia in learning economic concepts by undergraduates in UiTM Cawangan Sarawak, Malaysia by using the UTAUT model.

The rest of the paper is divided into four main components. Section 2 provides a synoptic review of the scholarly literature by focusing on theoretical background and hypotheses development. Section 3 outlines the methodology used in the study. Section 4 discusses the empirical results. The paper ends with concluding remarks in Section 5.

2. LITERATURE REVIEW

2.1 THEORETICAL BACKGROUND

The original UTAUT model was introduced by Venkatesh et al. (2003). Venkatesh et al. (2003) reviewed eight existing theories in order to develop a unified model. The original UTAUT model consists of four main constructs namely: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC) and four moderating variables: age, gender, experience and voluntariness of use.

In this paper, the extension of the UTAUT model is Career Awareness (CA) as the independent variable. Career awareness plays an important role in influencing student's preference of using ICT for academic assessment. In addition, we replaced the moderating variables of experience and voluntariness of use by hard skills (HS) and soft skills (SS), due to the requirement and suitability of HS and SS to complete the project by the students.

2.2 HYPOTHESIS DEVELOPMENT

The original four constructs and four moderating variables, as mentioned above, will not be elaborated in detail in this paper. The empirical findings of these studies are mixed. (See excellent literature review by Alshref et al. (2021), Mohebi (2021) and Nizar et al. (2019) on the use of ICT in teaching and learning using UTAUT model for additional insight). The new construct, namely Career Awareness (CA) and two new moderating variables which are hard skills (HS) and soft skills (SS) will be explained in detail in this paper.

Following Venkatesh et al. (2003), we briefly summarise the extended UTAUT model. PE refers to the extent of an individual's perception regarding the usefulness of the system in performing the tasks. EE refers to the extent of an individual's perception concerning the ease of using a system. SI refers to the reflection of peers, instructors, important people, and friends' perception regarding technology on the user's BI. FC refers to the availability of adequate support and resources such as organizational and technical infrastructure for the

proper use of technology. BI refers to the degree of intention to use IT. In general, these constructs positively influence the BI and UB of ICT in teaching and learning. Thus, the following hypotheses are proposed by the authors based on the review of the above literature:

H1: Performance Expectancy (PE) positively influences Behavioural Intention (BI).
H2: Effort Expectancy (EE) positively influences Behavioural Intention (BI).
H3: Social Influence (SI) positively influences Behavioural Intention (BI).
H4: Facilitating Conditions (FC) positively influences Use Behaviour (UB).
H5: Behavioural Intention (BI) positively influences Use Behaviour (UB).

We included a new construct namely Career Awareness (CA) to seek it influences the use of ICT in learning economic concepts. CA refers to the process of developing a comprehensive understanding of possible career opportunities which are influenced by various elements such as interest, skills and talents, job outlook, personal preferences, and relevant academic qualification (Bennett et al., 2021; Tsakissiris and Grant-Smith, 2021). The career awareness motivates and drives students to explore innovations and creativity which are largely driven by ICT. Thus, students tend to learn and improve their ICT skills for their academic performance and career readiness. Scholars have discovered that students could re-orient their careers if they know more about ICT and are able to integrate them in multiple disciplines. Thus, the following hypothesis is proposed by the authors based on the review of the literature:

H6: Career Awareness (CA) positively influences the Behavioural Intention (BI).

The standard moderating variables as reported in the UTAUT literature include age and gender. (See Sari (2022), Maican (2021) and Khechine (2014) for details of the empirical analyses of the age and gender on the BI and UB in the teaching and learning experience).
As for the moderating variables, the proposed hypotheses are:

H7: Age moderates the relationship between Performance Expectancy (PE) and Behavioural Intention (BI).
H8: Age moderates the relationship between Effort Expectancy (EE) and Behavioural Intention (BI).
H9: Age moderates the relationship between Social Influence (SI) and Behavioural Intention (BI).
H10: Age moderates the relationship between Career Awareness (CA) and Behavioural Intention (BI).
H11: Age moderates the relationship between Facilitating Conditions (FC) and Use Behaviour (UB).
H12: Gender moderates the relationship between Performance Expectancy (PE) and Behavioural Intention (BI).
H13: Gender moderates the relationship between Effort Expectancy (EE) and Behavioural Intention (BI).
H14: Gender moderates the relationship between Social Influence (SI) and Behavioural Intention (BI).
H15: Gender moderates the relationship between Career Awareness (CA) and Behavioural Intention (BI).
H16: Gender moderates the relationship between Facilitating Conditions (FC) and Use Behaviour (UB).

There are two new moderating variables that are included in this paper, namely: (a) hard skills and soft skills. The following sub-section explains the importance of these moderating variables in the online learning experience in higher learning institutions.

Hard Skills (HS) refer to discipline related or technical skills associated with a specific program of study or career field (Sunismi et al., 2022). For example, these skills include teaching skills, architecture skills, graphic design skills, and programming skills. Hard skills are learnable and typically measured by academic or professional examination results. The command of hard skills enables undergraduate students to use ICT either online or offline easily in performing their academic assessments. Alagu and Thanuskodi (2018) and Sayaf et al. (2022) discovered that hard skills such as ICT skills and knowledge were important to their academic performance in India and Saudi Arabia respectively.
Thus, the following hypothesis is proposed by the authors based on the review of the literature:

H17: Hard Skills (HS) moderates the relationship between Performance Expectancy (PE) and Behavioural Intention (BI).
H18: Hard Skills (HS) moderates the relationship between Effort Expectancy (EE) and Behavioural Intention (BI).
H19: Hard Skills (HS) moderates the relationship between Social Influence (SI) and Behavioural Intention (BI).
H20: Hard Skills (HS) moderates the relationship between Career Awareness (CA) and Behavioural Intention (BI).
H21: Hard Skills (HS) moderates the relationship between Facilitating Conditions (FC) and Use Behaviour (UB).

Soft Skills (SS) are transferable and non-technical skills which are applicable to all careers. Soft skills are typically associated with behaviors and personality traits of a person. For example, soft skills include critical thinking skills, problem solving skills, time management skills, and interpersonal skills. University students with excellent soft skills are highly sought by employers in the labour market. Most higher learning institutions incorporate soft skills elements in the academic curriculum and co-curriculum to improve the employability of students (Martin el. Al., 2023; Jainah et al., 2022). Students with good soft skills are reported to be more co-operative, employable, and productive (Attri and Kushwaha, 2018; Rodzalan and Jasman, 2022). However, Betti et al. (2022) discovered that innovative flipped classroom did not improve or worsen students' performance in terms of hard and soft skills.

Thus, the following hypothesis is proposed by the authors based on the review of the literature:
H22: Soft Skills (SS) moderates the relationship between Performance Expectancy (PE) and Behavioural Intention (BI).
H23: Soft Skills (SS) moderates the relationship between Effort Expectancy (EE) and Behavioural Intention (BI).
H24: Soft Skills (SS) moderates the relationship between Social Influence (SI) and Behavioural Intention (BI).
H25: Soft Skills (SS) moderates the relationship between Career Awareness (CA) and Behavioural Intention (BI).
H26: Soft Skills (SS) moderates the relationship between Facilitating Conditions (FC) and Use Behaviour (UB).

3. METHODOLOGY

3.1 RESEARCH MODEL

The unified theory acceptance and use of technology (UTAUT) model was extended and modified to explore the factors that influenced the BI and UB of students on using multimedia to explain economic concepts. The UTAUT model is able to predict 69 percent of the variance in the BI (Venkatesh et al., 2003). Thus, the UTAUT model is more preferable to study the acceptance of students on using multimedia to explain the economic concepts. The original UTAUT model consists of four main constructs namely: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC) and four moderating variables: age, gender, experience and voluntariness of use. In this paper, the extension of the UTAUT model was Career Awareness (CA) as the independent variable. In addition, we replaced the moderating variables of experience and voluntariness of use by hard skills (HS) and soft skills (SS), due to the requirement and suitability of HS and SS to complete the project by the students.

3.2 DATA COLLECTION AND INSTRUMENTATION

The sample used in this study included the students who took economics related subjects, namely economics (ECO415) and Macroeconomics (ECO211) in Universiti Teknologi MARA Cawangan Sarawak (UiTMCS). The students were required to complete a project which was to self-produce a short video clip to explain the economic concepts as part of their academic assessment for the semester of October 2019-Jan 2020. The economic lecturers explained to the students about the requirement and processes of conducting the project beginning of the semester.

The students answered a set of questionnaire at the end of the semester about the acceptance of using multimedia to explain the economic concepts. A total of 89 respondents participated the questionnaire, where 66 respondents were female and 23 students were male.

The scale for measuring the constructs was based on a set of 5-points Likert Scale. The responses for analysis were collected from 89 respondents via the manual questionnaire. The scale of "1 = Least Agree", "2 = Slightly Agree", "3 = Neutral", "4 = Agree", and "5 = Fully Agree" were used to indicate the level of agreement based on the items in the questionnaire. There was a total of 34 items included in the questionnaire, as listed in Table 1.

Constructs	Indicators	Items
Performance Expectancy (PE)	PE1	The project enhances my understanding of economic concepts.
	PE2	The project improves my application of economic concepts in my daily activities.
	PE3	The project helps me to improve my academic performance.
	PE4	The project helps me to achieve the learning outcome of my course.
Effort Expectancy (EE)	EE1	I understood the concepts easily through the short video clip production.
	EE2	I am more able to retain the economic concepts easily through the short video clip production.
	EE3	I can apply economic concepts with real-life examples easily through the short video clip production.
	EE4	I find that it is easy to complete the project.
Social Influence (SI)	SI1	My peers have been supporting me to produce a short video clip.
	SI2	My lecturers have been supporting me to produce a short video clip.
	SI3	My local community have been supporting me to produce a short video clip.
Facilitating Conditions (FC)	FC1	I have the hardware to produce a short video clip.
	FC2	I have the software to produce a short video clip.
	FC3	I can access the venue of the video shooting easily.
	FC4	I have hardware and software support from the university to produce a short video clip.
	FC5	I have enough time to complete the short video clip production.

Career Awareness (CA)	CA1	I am aware of career options in the film and creative industries.
	CA2	I am aware of the importance of creativity and intellectual property.
	CA3	I am aware and appreciate film as an art form.
	CA4	I would like to work in the film industry in the future instead of economic-related industries such as finance, banking, retailing and management.
Behavioural Intention (BI)	BI1	I prefer acting to face-to-face lectures when learning economic concepts after the project.
	BI2	I prefer acting to watching movies/films/videos when learning economic concepts.
	BI3	I prefer acting to reading textbooks/tests/quizzes when learning economic concepts.
	BI4	I prefer acting to writing assignments/term papers when learning economic concepts.
	BI5	I would like the same project to be continued for the next semester.
Use Behaviour (UB)	UB1	The project is useful.
	UB2	I became more interested in the course after completing the project.
	UB3	I participated actively in the classroom discussion after completing the project.
Hard Skills (HS)	HS1	I know how to use technology to complete the project.
	HS2	I know how to use financial knowledge to complete the project.
	HS3	I know the local socio-culture to complete the project.
Soft Skills (SS)	SS1	I can reflect on various aspects to complete the project.
	SS2	I am capable to use creativity to complete the project.
	SS3	I can manage emotional intelligence to complete the project.

Table 1 Items of Questionnaire

3.3 RESEARCH METHOD

The partial least squares structural equation modeling (PLS-SEM) is applied to explore the interrelation among the exogenous and endogenous latent variables, as shown in Figure 1. PLS-SEM is a second-generation technique in multivariate analysis which enables researchers to develop theories in exploratory research (Hair et al. 2016). The use of PLS-SEM is not required for the normality assumption on the data but this method could perform a high level of

statistical power with a small sample size (Hair et al., 2016). The PLS-SEM could handle complex models with several integrated relations and moderating effects, which were the goals of this study. The PLS-SEM was performed in two stages: namely the measurement model and followed by the structural model. All the analyses were carried out by using a software named SmartPLS version 3.3.3.

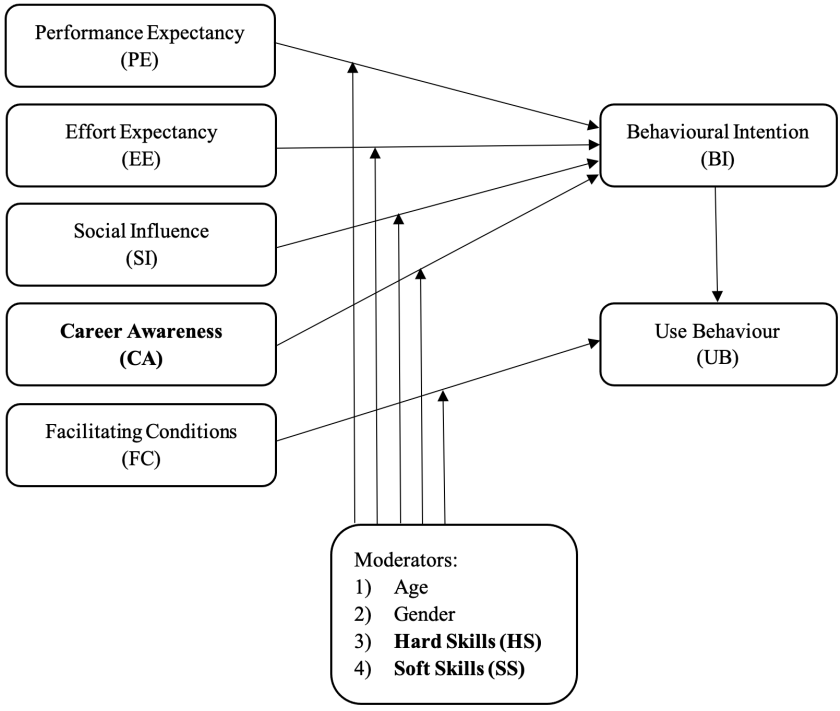

Fig 1: The Conceptual Model

Note: Career awareness, hard skills and soft skills are new variables.

4. RESULTS AND DISCUSSIONS

4.1 MEASUREMENT MODEL

The first stage of data analysis was to assess the measurement model which was also called the outer models. In this study, all the exogenous latent variables and endogenous latent variables were reflective measurement models. The relationship between all the constructs and their reflective indicators were determined through outer loadings (individual indicator reliability), internal consistency (Cronbach's alpha and composite reliability), convergent validity (average variance extracted), and discriminant validity.

The acceptable reliability of the indicators could be determined initially through the outer loadings which was preferably more than 0.708 (Hair et al., 2019). Meanwhile, the weaker outer loadings ranged between 0.4 to 0.7. The indicators could be retained if the exclusion did not elevate the value of composite reliability (CR) and to avoid the reduction in validity. Therefore, the indicators of EE4 (0.621), FC4 (0.633) and BI5 (0.588), as depicted in Table 2, were maintained as the deletion of these indicators did not exhibit a sharp rise in the value of CR and also retained the validity of the data.

For internal consistency, the interpretation for both Cronbach's alpha and composite reliability (CR) was the same. If the value was more than 0.7, the Cronbach's alpha and CR of the indicators were considered acceptable and satisfactory (Taber, 2017; Hair et al., 2019). Meanwhile, the CR value of more than 0.95 was not advisable, as it reflected the redundancy of all the reflective indicators. The results of all the constructs were reliable because the scale of Cronbach's Alpha was between 0.737 and 0.878, as demonstrated in Table 2. The CR also showed that the value varied from 0.834 to 0.914, which denoted that all the constructs were reliable.

The average variance extracted (AVE) could be used to measure the convergent validity for all the latent variables (Benitez et al., 2020). Any constructs with an AVE greater than 0.5 was acceptable, as it denoted that more than 50% of the variance for all the indicators could be explained by the respective construct (Hair et al., 2019). Table 2 reported that all the constructs' AVE was more than 0.5, which have fulfilled the rule of thumb for the convergent validity.

Indicatorts		Outer Loadings	Mean	SD	Cronbach's Alpha	CR	AVE
PE	PE1	0.826	3.888	0.785	0.865	0.907	0.710
	PE2	0.842	3.730	0.871			
	PE3	0.867	3.753	0.838			
	PE4	0.835	3.764	0.874			
EE	EE1	0.812	3.843	0.777	0.737	0.834	0.559
	EE2	0.731	3.618	0.800			
	EE3	0.811	3.618	0.742			
	EE4	0.621	3.596	0.980			
SI	SI1	0.842	4.067	0.804	0.805	0.885	0.719
	SI2	0.881	3.933	0.845			
	SI3	0.820	3.742	0.906			
FC	FC1	0.802	3.719	1.028	0.803	0.861	0.555
	FC2	0.746	3.989	0.930			
	FC3	0.703	3.551	1.060			
	FC4	0.633	3.011	1.185			
	FC5	0.826	3.281	1.101			
CA	CA1	0.905	3.472	0.937	0.845	0.892	0.675
	CA2	0.850	3.843	0.833			
	CA3	0.727	3.910	0.843			
	CA4	0.794	3.135	1.192			
BI	BI1	0.823	3.360	1.164	0.878	0.915	0.687
	BI2	0.876	3.169	1.114			
	BI3	0.927	3.225	1.057			
	BI4	0.883	3.191	1.090			
	BI5	0.588	3.921	1.775			
UB	UB1	0.839	3.674	1.036	0.823	0.895	0.740
	UB2	0.917	3.461	0.849			
	UB3	0.821	3.551	0.793			
HS	HS1	0.806	4.056	0.740	0.797	0.877	0.705
	HS2	0.799	3.618	1.022			
	HS3	0.910	3.865	0.737			
SS	SS1	0.843	3.944	0.725	0.788	0.874	0.698
	SS2	0.851	4.180	0.743			
	SS3	0.812	3.933	0.614			

Note: PE = Performance Expectancy, EE = Effort Expectancy, SI = Social Influence, FC = Facilitating Conditions (FC), CA = Career Awareness, HS = Hard Skills, SS = Soft Skills, SD = Standard Deviation, CR = Composite Reliability, and AVE = average variance extracted

	PE	EE	SI	FC	CA	BI	UB	HS	SS
PE									
EE	0.800								
SI	0.846	0.844							
FC	0.527	0.833	0.546						
CA	0.673	0.669	0.533	0.414					
BI	0.580	0.583	0.468	0.548	0.761				
UB	0.825	0.736	0.593	0.642	0.630	0.595			
HS	0.421	0.443	0.376	0.404	0.351	0.371	0.300		
SS	0.283	0.312	0.237	0.247	0.297	0.171	0.255	0.842	

Note: PE = Performance Expectancy, EE = Effort Expectancy, SI = Social Influence, FC = Facilitating Conditions (FC), CA = Career Awareness, BI = Behaviour Intention, UB = Use Behaviour, frgHS = Hard Skills, SS = Soft Skills

The last step of reflective measurement model analysis was the evaluation of the discriminant validity. Discriminant validity was used to investigate how much a construct differed from other constructs (Hair et al., 2016). There were three methods to measure the discriminant validity which included: Fornell-Larcker Criterion, Cross Loadings and Heterotrait-Monotrait Ratio (HTMT). Fornell-Larcker criterion and cross loadings were the conventional approaches to test the discriminant validity but unfortunately, both approaches were underperformed when there was only a minor difference among the outer loadings that belonged to the same construct (Henseler et al., 2015; Hair et al., 2019).

Therefore, Henseler et al. (2015) proposed the HTMT approach to overcome the limitation of the Fornell-Larcker criterion and cross loadings. The threshold value for the HTMT was 0.90 if there were conceptual similarities among the structural constructs and 0.85 if the structural constructs were conceptually distinctive (Henseler et al., 2015). Thus, there was a lack of discriminant validity if the HTMT was exceeding 0.85 or 0.90. Table 3 showed that the value of HTMT for all the constructs were less than the threshold value of 0.85, which reflected that the discriminant validity was present.

The internal consistency, convergent validity and discriminant validity had been tested and fulfilled, which were the key criteria for reflective constructs to meet the requirement of using PLS-SEM analysis. Thus, we could proceed to the next stage of analysis, which was the structural model.

4.3 STRUCTURAL MODEL

In this stage, the efficiency of the proposed structural model (also called the inner model) on prediction and the correlation between constructs was analysed. In this model, the collinearity test was examined first and then followed by significance and relevance of path coefficients, coefficient of determination (R2), effect size (f 2) and predictive relevance (Q2) (Benitez et al., 2020). The results of path coefficients, R2, f2 and Q2 were tabulated in Table 4.

Investigation on the collinearity of structural models was necessary to avoid the bias in regression results, as the path coefficients were estimated from a series of ordinary least squares (OLS) regressions (Hair et al., 2019). The collinearity problems could be traced through variance inflation factor (VIF) values with a threshold value of five. VIF value of more than 5 indicated that the presence of collinearity issue between endogenous and exogenous latent variables. Based on Table 4, there were no collinearity problems, as all the VIF values were lower than 5.

The hypotheses H4, H5 and H6 were not rejected, as the p-value were less than 0.01. Thus, there was a significant influence of CA on the BI of UiTM students for explaining economic concepts via multimedia. Meanwhile, the FC and BI had significant influence on the UB of the students. The path coefficients for H4 ($\beta = 0.395$), H5 ($\beta = 0.329$) and H6 ($\beta = 0.580$) also revealed that there was a positive relationship between these proposed constructs.

On the other hand, the hypotheses of H1, H2, and H3 were rejected. Thus, there was no effect of PE, EE and SI on UiTM students' BI for using multimedia to explain economic concepts. The explanatory capabilities of endogenous constructs was determined by the coefficient

of determination (R2). In this model, the R2 value of students' BI and UB of using multimedia to explain concepts in economics was 0.518 and 0.385 respectively. Thus, 51.8% of students' BI could be explained by the four main exogenous constructs (PE, EE, SI, CA) and 38.5% of students' UB could be explained by the BI and FC. According Hair et al. (2017), the level of R2 values for both BI and UB were considered moderate.

The effect size, f2 was used to examine the impact of excluding a particular exogenous construct in the proposed model on the endogenous construct. Cohen (1992) had categorised the effect size as small (0.02), medium (0.15) and large (0.35) for multiple and multiple partial correlation tests. In Table 4, there was a small effect of BI on UB, a medium effect of FC on UB and a large effect of CA on BI. There was no effect of PE, EE and SI on BI as all the values are less than 0.02.

The predictive relevance or Stone-Geisser indicator, Q2 was the last stage of structural model analysis. The value of Q2 was used to examine the significance of predictive power of the exogenous latent variables (PE, EE, SI, CA and FC) on the endogenous latent variables (BI and UB). If the Q2 value was larger than zero, the predictive relevance between the exogenous and endogenous latent variables was present. Thus, the exogenous latent variables had predictive relevance with both BI and UB, as shown in Table 5.

Overall, the PE, EE and SI had weak effect on BI, while CA had strong effect on BI of students on using multimedia to explain economic concepts. Thus, PE, EE and SI could not influence BI, and only CA could influence BI. On the other hand, both FC and BI could influence UB.

Hypotheses	Path	VIF	Direct Effect	Significant	f 2 effect size	Remark
H1	PE → BI	2.499	0.116	No *(p > 0.10)*	0.011	Reject
H2	EE → BI	2.206	0.111	No *(p > 0.10)*	0.012	Reject
H3	SI → BI	2.344	-0.009	No *(p > 0.10)*	< 0.001	Reject
H6	CA → BI	1.611	0.580	Yes *(p < 0.01)*	0.433	Do not reject
H4	FC → UB	1.274	0.395	Yes *(p < 0.01)*	0.199	Do not reject
H5	BI → UB	1.274	0.329	Yes *(p < 0.01)*	0.139	Do not reject

Note: Note: PE = Performance Expectancy, EE = Effort Expectancy, SI = Social Influence, FC = Facilitating Conditions (FC), CA = Career Awareness, BI = Behaviour Intention, UB = Use Behaviour, VIF = variance inflation factor. H6 is placed before H4 in order to test the BI first and then UB

	R^2	R^2 *Adjusted*	Q^2 *(= 1 – SSE/SSO)*
BI	*0.518*	*0.495*	*0.329*
UB	*0.385*	*0.371*	*0.263*

Table 5 The Level of R2 and Q2 of Endogeneous Constructs

4.4 MODERATOR ANALYSIS

In this paper, there were four moderating variables which include: age, gender, hard skills (HS) and soft skills (SS). The measurement model assessments for HS and SS were reported in Table 2 and Table 3, but age and gender were not included. The age and gender were categorical data, thus, multigroup analysis (MGA) was used to examine the measurement model for them (Cheah et al., 2019) and the results were shown in Table 6 and 7.

The age moderator was divided into two categories namely: (a) low age (20 years old) and high age (21-24 years old) to assess the outer loadings (individual indicator reliability), internal consistency (Cronbach's alpha and composite reliability), convergent validity (average variance extracted), and discriminant validity. Based on Table 6, CA (Cronbach's alpha), CR (composite reliability) and AVE (average variance extracted) of all the constructs exceeded the threshold values under low age category. However, the Cronbach's alpha of EE was less than 0.7 and AVE was less than 0.5 for the high age category. SI reported similar situation with EE whereby the CR was less than 0.7 and AVE was less than 0.5. Therefore, the EE and SI were not reliable and not valid for the moderation analysis. The HTMT values in Table 7 revealed that the discriminant validity was not established for both low and high age categories because the values exceeded the threshold value of 0.85. Thus, both low and high age categories did not satisfy the measurement model assessment.

The gender moderator was divided into female and male categories for assessing the measurement model. For the female category, all the constructs exceeded the threshold value of CA, CR and AVE. Nonetheless, the FC construct under the male category did not fit the criteria of CR and AVE. Therefore, the FC was not reliable and not valid to be assessed in the next stage. Based on Table 8, the HTMT values presented the discriminant validity was not established for both female and male group because some values were beyond the threshold value of 0.85. Thus, the measurement model assessment failed for both the female and male groups.

Therefore, the hypotheses from H7 to H16 were rejected. As for HS and SS moderators, Table 2 and 3 have shown that the measurement model assessment was successful for both moderators. As shown in Table 8, only two hypotheses were significant, namely: H21 and H26, while the remaining hypotheses were not significant.

Hard skills refer to the specific technical knowledge and trainings which are teachable and measurable. Based on Table 4, the relationship between FC and UB was significant. After adding the moderator of hard skills variable, the relationship between FC and UB was still

significant, as demonstrated in Table 8. The direct effect between FC and UB in Table 4 had positive effect, and with the presence of moderator of hard skills variable, the indirect effect between FC and UB was still positive and became stronger. Thus, hard skills strengthened the relationship between FC and UB. This implied that the students must know the how-to-do in order to make the use of the facilities in teaching and learning.

Soft skills are personality traits and personal qualities which are self-developed or self-taught. Based on Table 4, the relationship between FC and UB is significant. After adding the moderator of soft skills variable, the relationship between FC and UB is still significant, as demonstrated in Table 8. The direct effect between FC and UB in Table 4 had positive effect. However, with the presence of moderator of soft skills variable, the indirect effect between FC and UB became negative. Thus, the more soft skills the students possess, the less the facilitating conditions is required on use behavior of students. This result indicated that the more creative the students, less technology was required in using multimedia as a learning tool.

Construct	AGE					
	Low Age			**High Age**		
	CA > 0.7	CR > 0.7	AVE > 0.5	CA > 0.7	CR > 0.7	AVE > 0.5
PE	0.875	0.915	0.728	0.816	0.844	0.577
EE	0.728	0.824	0.551	0.628	0.755	0.444
SI	0.813	0.890	0.730	0.753	0.661	0.452
CA	0.847	0.893	0.679	0.794	0.857	0.601
FC	0.781	0.850	0.533	0.798	0.833	0.517
BI	0.867	0.906	0.665	0.839	0.898	0.659
UB	0.767	0.863	0.679	0.874	0.923	0.799

Construct	GENDER					
	Female			Male		
	CA > 0.7	CR > 0.7	AVE > 0.5	CA > 0.7	CR > 0.7	AVE > 0.5
PE	0.876	0.915	0.729	0.813	0.832	0.565
EE	0.739	0.831	0.554	0.754	0.848	0.604
SI	0.827	0.896	0.742	0.760	0.848	0.661
CA	0.862	0.905	0.706	0.791	0.847	0.586
FC	0.802	0.863	0.560	0.781	0.529	0.308
BI	0.878	0.913	0.681	0.881	0.919	0.702
UB	0.793	0.879	0.708	0.917	0.947	0.856

Table 6 The Measurement Model Assessment for the Age and Gender Moderators

LOW AGE (20 years old)							
	PE	**EE**	**SI**	**CA**	**FC**	**BI**	**UB**
PE							
EE	0.759						
SI	0.878	0.827					
CA	0.703	0.647	0.564				
FC	0.521	0.814	0.544	0.409			
BI	0.617	0.454	0.570	0.803	0.439		
UB	0.743	0.668	0.596	0.580	0.596	0.549	
HIGH AGE (21-24 years old)							
	PE	**EE**	**SI**	**CA**	**FC**	**BI**	**UB**
PE							
EE	0.928						
SI	0.754	0.895					
CA	0.466	0.654	0.455				
FC	0.414	0.755	0.433	0.279			
BI	0.321	0.724	0.180	0.529	0.724		
UB	0.887	0.829	0.488	0.590	0.531	0.490	

FEMALE							
	PE	**EE**	**SI**	**CA**	**FC**	**BI**	**UB**
PE							
EE	0.804						
SI	0.863	0.770					
CA	0.631	0.676	0.533				
FC	0.599	0.863	0.507	0.493			
BI	0.654	0.624	0.562	0.776	0.693		
UB	0.833	0.843	0.699	0.545	0.895	0.656	
MALE							
	PE	**EE**	**SI**	**CA**	**FC**	**BI**	**UB**
PE							
EE	0.803						
SI	0.768	1.031					
CA	0.880	0.637	0.500				
FC	0.417	0.780	0.682	0.321			
BI	0.461	0.457	0.247	0.740	0.499		
UB	0.831	0.449	0.289	0.903	0.204	0.457	

Table 7 HTMT for the Age and Gender Moderators

Moderating Variables	Hypotheses	Path	Indirect Effect	Significant	Remark
Hard Skills (HS)	H17	PE → BI	-0.254	No *(p > 0.10)*	Reject
	H18	EE → BI	-0.032	No *(p > 0.10)*	Reject
	H19	SI → BI	0.059	No *(p > 0.10)*	Reject
	H20	CA → BI	0.163	No *(p > 0.10)*	Reject
	H21	FC → UB	0.986	Yes *(p < 0.01)*	Do not reject
Soft Skills (SS)	H22	PE → BI	0.149	No *(p > 0.10)*	Reject
	H23	EE → BI	0.287	No *(p > 0.10)*	Reject
	H24	SI → BI	-0.242	No *(p > 0.10)*	Reject
	H25	CA → BI	0.097	No *(p > 0.10)*	Reject
	H26	FC → UB	-0.240	Yes *(p < 0.10)*	Do not reject

Table 8 Moderation Analysis

CONCLUSION

This paper aimed to examine the determinants of the acceptance on the use of multimedia in learning economic concepts among graduates who took economics related subjects in UiTM Cawangan Sarawak, Malaysia. The original four constructs from the UTAUT models were employed, namely PE, EE, SI and FC. The model was extended by including a new construct, that was career awareness (CA) and two new moderating variables which were hard skills (HS) and soft skills (SS).

Overall, the PE, EE and SI had weak effect on BI, while CA had strong effect on BI of students on using multimedia to explain economic concepts. Thus, PE, EE and SI could not influence BI, and only CA could influence BI. On the other hand, both FC and BI could influence UB. The moderating variables such as gender and age did not have any influence, while hard skills

and soft skills had influence on the use behavior (UB) of students. Both hard skills and soft skills moderated the relationship between facilitating conditions (FC) and Use Behaviour (UB).

Based on the above results, several policies could be suggested for the further improvement of learning experience by the university students. Firstly, students should be given more exposure to career awareness that is related to technologies (Tang et al., 2023). This would enable students to be equipped with better technological knowledge in order to be more employable in the labour market. Secondly, the university should improve the FC in order to encourage students to continue to use technologies in their academic projects. The facilitating infrastructures such as technologies, equipment, and technologies-related trainings could be implemented as some of the academic subjects or workshops for the students. Thirdly, various skills program could be further improved in order to develop the skills among students. The suggested skills programs include soft skills programs, entrepreneurship programs, career exhibitions, volunteering programs, and community services. These programs are important to create career awareness and opportunities, development of hard skills and soft skills to nurture and prepare university students to be more employable and competent at both local and international level (Hamzah et al., 2022; Mohamad et al., 2017).

This study has several limitations. Among others, these include small sample size where the sample consists of students who took economics related subjects and limited moderating variables. Future researchers could enlarge the sample size, explore new constructs and moderating variables and apply them in other academic subjects in both lower and higher learning institutions to achieve more generalized results.

Although the study has its limitations, our findings nonetheless suggest that career awareness influenced the behavioural intention of students, and both hard skills and soft skills moderated the facilitating condition and use behaviour of students on the acceptance of using multimedia in their learning.

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