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A Preliminary Study on Key Variables Related to Students' Continuance Intention to Pursue Academic Micro-Credentials at Universiti Putra Malaysia

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Abstract: This preliminary study applied the Unified Theory of Acceptance and Use of Technology (UTAUT) and Expectancy-Confirmation Theory (ECT) to examine the key variables related to students' continuance intention in academic micro-credential learning at Universiti Putra Malaysia. Thirty-one valid responses were obtained through a structured questionnaire survey measuring performance expectancy, effort expectancy, social influence, facilitating conditions, confirmation, satisfaction, and continuance intention. Reliability was high for all scales (Cronbach's α>.87; overall reliability of .99). Descriptive statistics show that participants reported higher levels of performance expectancy, effort expectancy, and satisfaction, indicating that students generally perceived online micro-credentials as useful and easy to use, were satisfied with their overall learning experience, and expressed strong intentions to continue using the platform. This pilot study established a methodological basis for future empirical studies and proved the validity and suitability of a scale derived from the UTAUT and ECT within the Malaysian higher education context. The pilot test sample was limited to undergraduate students enrolled at a single university, which restricted the extent of the findings.

Keywords: micro-credentials, unified theory of acceptance and use of technology (UTAUT), expectancy-confirmation theory (ECT)

1. Introduction

Micro-credentials have expanded rapidly in higher education, driven by the global surge in digital learning. They provide a flexible, competency-based approach to certification, for example, narrowing the gap between traditional degree programs and the actual labour market in the face of the rapid advancements in technology and the rise in lifelong learning (Alenezi et al., 2024). Micro-credentials are more appropriate for contemporary learners, especially those looking to improve their job competitiveness and adult learners, than traditional degree programs, which are long and strictly structured (Raghavan et al., 2025). Micro-credentials are now an essential tool for universities to offer individualised learning paths and enhance student competencies because of the variety of educational formats. A significant obstacle to educational reform is the low uptake and limited sustained engagement with micro-credentials, despite their gradual introduction in Malaysia, including at universities such as Universiti Putra Malaysia (UPM).

With a focus on professional skills and transferable knowledge, micro-credentials are digitally certified and usually require completion of brief, targeted courses or modules (Kumar et al., 2022). In addition to being adaptable, this type of certification is simple to incorporate into already-existing Learning Management Systems (LMSs), such as Moodle or Canvas,

allowing for the automatic issuing of micro-credentials and the traceability and manageability of learning paths (Keenan, 2023). Despite their differences, LMSs and micro-credentials collaborate closely to support modular learning (Brush & Kirvan, 2019). Despite the enthusiasm surrounding micro-credentials, uncertainties remain about their demand among Malaysian learners. Issues related to the consistency of these credentials, the diversity of terms used to describe them, and the lack of standardization create challenges for stakeholders, making it difficult for universities, employers, and learners to assess their value and relevance (Laryea et al., 2021; Oliver, 2022).

This pilot study questionnaire is grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT) and Expectation-Confirmation Theory (ECT). ECT explains how learners' pre-use and post-use experiences influence satisfaction and the decision to continue (Oliver, 1980; Shukla et al., 2025), while UTAUT accounts for technology use intentions through performance expectancy, effort expectancy, social influence, and facilitating conditions (Marikyan & Papagiannidis, 2023). In the context of micro-credentials, each theory provides valuable but partial explanations. UTAUT highlights initial adoption incentives, whereas ECT emphasises post-use fulfilment and validation, which better capture sustained engagement. A more comprehensive understanding of long-term adoption and promotion of micro-credentials can be achieved by integrating the two perspectives, thereby addressing both initial adoption and continuous learning intention. When combined, UTAUT and ECT offer a framework for examining learners' intention to persist in micro-credential learning within Malaysian higher education. The purpose of this study was to assess the measurement stability and internal consistency of instruments designed to evaluate students' intention to continue learning and to explore the feasibility of applying these tools in larger, future research projects.

2. Methodology

This pilot study aimed to gather preliminary insights into factors that contribute to students' continuance intention in pursuing academic micro-credentials at UPM. As such, this study described the major variables examined among UPM students in relation to their continued intention to pursue academic micro-credentials using a quantitative research methodology and a structured questionnaire as a data collection tool. The questionnaire was developed using established scales from the literature and included factors from the Expectation-Confirmation Theory (ECT) and the Unified Theory of Acceptance and Use of Technology (UTAUT). While the ECT variables (Confirmation and Satisfaction) explain students' sustained engagement after the course, the UTAUT variables (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions) explain students' initial adoption intentions. By gathering these two kinds of data at the same time, this study can uncover the mechanisms that connect adoption and persistence, providing more thorough explanation of the difficulties in promoting and accepting micro-credentials. 5-point Likert scale was used to evaluate each assessment variable, which included expectations for performance, effort, social influence, facilitation, normativeness, satisfaction, and motivation to learn more.

Data were collected from 31 participants who had just completed an academic micro-credentials course related to Malay Language Communication, a compulsory course for non-native Malay students at UPM. Their participation was voluntary and all of them were undergraduate students in their first semester at the time of this study. All of them has signed the consent form for this study. The Cronbach's alpha coefficient (Cronbach, 1951) was calculated to assess the internal consistency of the instrument. Hair et al. (2014) recommended a reliability score of .70 or higher as an ideal threshold for achieving acceptable internal consistency and to demonstrate adequate reliability. Table 1 shows that the α values for all constructs are above .70, indicating acceptable to high internal consistency of the measurement scales.

Table 1. *Reliability of the constructs*

Variable	No. of Items	α value [n=31]
Performance Expectancy (PE)	8	.95

Effort Expectancy (EE)	7	.87
Social Influence (SI)	7	.96
Facilitating Conditions (FC)	7	.92
Confirmation (CF)	6	.95
Satisfaction (ST)	10	.95

3. Results

There were thirty-one respondents in the study, and all of them were undergraduate students in their first year of study at UPM. The proportions of male and female participants are 45.20% and 54.80%, respectively. A significant majority of respondents (93.5%) reported having completed at least one micro-credential course in the preceding six months. This study performed reliability assessments on seven scales (PE, EE, SI, FC, CF, ST, and CI) using a valid sample size of 31 participants, assuring the exclusion of any missing values. The Cronbach's alpha coefficient for each scale exhibited exceptional internal consistency.

Table 2 showed that all scales had high Cronbach's Alpha coefficients (.87–.96), indicating high internal reliability and consistency. The highest mean score was obtained for the Satisfaction (ST) scale (M = 45.23, SD = 6.30), indicating that respondents expressed the greatest agreement with items related to satisfaction. This implies that the entire organisation, experience, and learning process of using online micro-credentials were well regarded by students. Additionally, the mean ratings on the EE scale (M=31.19, SD=4.77) and PE scale (M=36.00, SD=5.99) were likewise rather high, suggesting that respondents generally thought online micro-credentials were very useful and gave them positive remarks regarding how easy they were to use. The CF (M=26.74, SD=4.44), CI (M=26.48, SD=4.43), and SI (M=29.32, SD=6.63) ratings, in contrast, were somewhat lower but remained within the high range, indicating some degree of positive recognition in terms of social influence, sense of validation, and intention to continue using. The research instrument's stability and measurement consistency were further validated by the extraordinarily high reliability (α=.99) and overall mean of the 51 items, which was 226.19 (SD=33.68).

Table 2. *Cronbach's Alpha (Reliability) Results of Variables*

Scale	Cronbach's Alpha	No. of Items	Mean	S.D.	Variance
PE	.95	8	36.00	5.99	35.94
EE	.87	7	31.19	4.77	22.76
SI	.96	7	29.32	6.63	43.89
FC	.92	7	31.23	4.86	23.58
CF	.95	6	26.74	4.44	19.73
ST	.95	10	45.23	6.30	39.65
CI	.94	6	26.48	4.43	19.59

Table 3 shows the specific response distribution for each item. The frequency and percentage of most items show that most respondents tended to "agree" or "strongly agree," showing high approval of online micro-credentials. For example, in the PE scale, over 87% of respondents agreed or strongly agreed that online micro-credentials can improve learning efficiency (PE_3) and have a positive impact (PE_4, with 71% selecting "strongly agree"). In the EE scale, most respondents found them easy and clear to use (74.2% "strongly agreed" in EE_5) and easy to master (83.8% "agree" or "strongly agree" in EE_6). Despite a slightly reduced level of agreement, almost half of the respondents on the SI scale still believed that their teachers and peers encouraged them to use online micro-credentials (such as 54.8% "strongly agree" or "agree" for SI_4). The FC scale results indicate that most students believe the platform is highly compatible (71% "strongly agree" on FC_2) and provides clear learning paths and resource support (over 64.5% "strongly agree" on FC_4 and FC_5). Results from the CF and ST scales further support user satisfaction, with ST_8 (overall experience very satisfactory) receiving a 74.2% "strong agreement" rating and ST_5 (good decision-making) also receiving

a high level of approval (67.7%). Finally, on the CI scale, over 80% of respondents expressed a willingness to continue using or recommend online micro-credentials (for example, 64.5% "strongly agree" on CI_2). Overall, these results demonstrate that students not only recognize the learning value of online micro-credentials but also demonstrate a positive intention to continue using them.

Table 3. *Frequency and Percentage of All Items*

Variables	SD		D		N		A		SA	
	f	%	f	%	f	%	f	%	f	%
PE_1: Using online micro-credentials for my learning enables me to accomplish academic task more quickly.	0	0	2	6.50	2	6.50	6	19.40	21	67.70
PE_2: Using online micro-credentials can improve my academic performance.	0	0.00	2	6.50	3	9.70	5	16.10	21	67.70
PE_3: Online micro-credentials increases my efficiency in learning.	0	0.00	2	6.50	1	3.20	7	22.60	21	67.70
PE_4 Online micro-credentials has a positive effect on my learning.	0	0.00	2	6.50	1	3.20	6	19.40	22	71.00
PE_5: Using online micro-credentials makes it usefulness to learn online.	1	3.20	1	3.20	1	3.20	8	25.80	20	64.50
PE_6: I find online micro-credentials useful for my online learning.	0	0.00	1	3.20	0	0.00	10	32.30	20	64.50
PE_7: Online micro-credentials make learning at university more beneficial for me.	0	0.00	1	3.20	2	6.50	7	22.60	21	67.70
PE_8: Online micro-credentials make learning at university more accessible for me.	1	3.20	2	6.50	1	3.20	6	19.40	21	67.70
EE_1: I find online micro-credentials to be user-friendly.	1	3.20	0	0.00	1	3.20	8	25.80	21	67.70
EE_2: My interaction with online micro-credentials for online learning is clear.	0	0.00	1	3.20	4	12.90	8	25.80	18	58.10
EE_3: My interaction with online micro-credentials is understandable.	1	3.20	1	3.20	1	3.20	4	12.90	24	77.40
EE_4: My interaction with online micro-credentials does not require me to think a lot.	0	0.00	3	9.70	5	16.10	5	16.10	18	58.10
EE_5: The process of using online micro-credentials is clear.	0	0.00	0	0.00	3	9.70	5	16.10	23	74.20
EE_6: It is easy for me to become skillful at using online micro-credentials.	0	0.00	1	3.20	4	12.90	5	16.10	21	67.70
EE_7: Online micro-credentials is easy to handle whenever I encounter a problem.	1	3.20	2	6.50	2	6.50	7	22.60	19	61.30
SI_1: People who are important to me think that I should use online micro-credentials.	0	0.00	3	9.70	6	19.40	6	19.40	16	51.60

SI_2: Using online micro-credentials enhances my image among peers and lecturers.	1	3.20	1	3.20	8	25.80	7	22.60	14	45.20
SI_3: People around me think that more courses should be delivered as online micro-credentials.	0	0.00	3	9.70	4	12.90	5	16.10	19	61.30
SI_4: My classmates encourage me to use online micro-credentials.	1	3.20	1	3.20	7	22.60	5	16.10	17	54.80
SI_5: Lecturers in my institution have been helpful in the use of online micro-credentials.	1	3.20	2	6.50	3	9.70	7	22.60	18	58.10
SI_6: Using online micro-credentials is encouraged by my academic community.	1	3.20	2	6.50	3	9.70	9	29.00	16	51.60
SI_7: People around me think that I should take advantage of online micro-credential courses.	0	0.00	2	6.50	5	16.10	7	22.60	17	54.80
FC_1: I have access to the necessary resources to undergo my online micro-credentials learning journey.	1	3.20	0	0.00	4	12.90	9	29.00	17	54.80
FC_2: Online micro-credentials are compatible with other learning resources I use.	0	0.00	0	0.00	1	3.20	8	25.80	22	71.00
FC_3: Support from the PutraMOOC platform is available when problems are encountered in online micro-credentials.	1	3.20	0	0.00	3	9.70	7	22.60	20	64.50
FC_4: My institution provides a clear pathway to stack multiple micro-credentials into a full course for qualification.	0	0.00	1	3.20	3	9.70	7	22.60	20	64.50
FC_5: There is clear information and guidance on how to accumulate micro-credentials to achieve a recognized certification.	0	0.00	0	0.00	3	9.70	8	25.80	20	64.50
FC_6: The university has communicated how micro-credential modules are linked to formal academic awards or credit transfer.	0	0.00	2	6.50	3	9.70	8	25.80	18	58.10
FC_7: The online platforms used by my institution make it easy to enroll in small, modular micro-credential courses.	1	3.20	1	3.20	1	3.20	10	32.30	18	58.10
CF_1: My experience with using online micro-credentials was better than what I expected.	0	0.00	2	6.50	1	3.20	9	29.00	19	61.30
CF_2: The content delivered through online micro-credentials was more thoughtful than what I expected.	0	0.00	0	0.00	1	3.20	13	41.90	17	54.80
CF_3: The benefit I received from using online micro-credentials matched my expectations.	1	3.20	1	3.20	1	3.20	11	35.50	17	54.80

CF_4: Most of my expectations from using online micro-credentials were confirmed.	0	0.00	2	6.50	1	3.20	11	35.50	17	54.80
CF_5: I am satisfied with the overall performance of online micro-credentials.	0	0.00	1	3.20	1	3.20	9	29.00	20	64.50
CF_6: Online micro-credentials performed as good as I thought it would.	1	3.20	1	3.20	0	0.00	9	29.00	20	64.50
ST_1: Online micro-credentials was well organized.	1	3.20	1	3.20	1	3.20	8	25.80	20	64.50
ST_2: My decision to use online micro-credentials was a wise one.	1	3.20	0	0.00	1	3.20	12	38.70	17	54.80
ST_3: The duration for the use of online micro-credentials was long enough.	1	3.20	0	0.00	1	3.20	12	38.70	17	54.80
ST_4: I am satisfied with using online micro-credentials.	0	0.00	0	0.00	3	9.70	10	32.30	18	58.10
ST_5: I think, I did the right thing by deciding to use online micro-credentials.	0	0.00	1	3.20	0	0.00	9	29.00	21	67.70
ST_6: I felt comfortable with my classmates and the tutors in online micro-credentials.	1	3.20	0	0.00	2	6.50	6	19.40	22	71.00
ST_7: I felt involved in online micro-credentials.	0	0.00	0	0.00	1	3.20	13	41.90	17	54.80
ST_8 I feel extremely satisfied about my overall experience of using online micro-credentials.	0	0.00	1	3.20	1	3.20	6	19.40	23	74.20
ST_9 I am satisfied with the work of group as a community in online micro-credentials.	0	0.00	1	3.20	1	3.20	11	35.50	18	58.10
ST_10: I have a positive impression towards online micro-credentials.	0	0.00	2	6.50	1	3.20	9	29.00	19	61.30
CI_1: I intend to continue using online micro-credentials rather than discontinue its use.	1	3.20	0	0.00	4	12.90	9	29.00	17	54.80
CI_2: My intention is to continue using the online micro-credentials platform.	0	0.00	0	0.00	4	12.90	7	22.60	20	64.50
CI_3: If I could, I would like to continue my use of online micro-credentials.	0	0.00	0	0.00	5	16.10	7	22.60	19	61.30
CI_4: I will use online micro-credentials on a regular basis in the future.	0	0.00	0	0.00	5	16.10	7	22.60	19	61.30
CI_5: I will frequently use online micro-credentials in the future.	0	0.00	0	0.00	5	16.10	8	25.80	18	58.10
CI_6: I will strongly recommend others to use online micro-credentials.	0	0.00	3	9.70	4	12.90	4	12.90	20	64.50

*SD = strongly disagree, D = disagree, N = neutral, A = agree, SA = strongly agree

Based on Table 3, the data aligns with Table 2 considering that respondents' feedback demonstrated a positive trend in reliability and mean scores, and demonstrated a high level of satisfaction, a recognition of ease of use, and positive intention towards future use of the product. Thus, the findings of the pilot test showed that the measurement scales used in the study were found to be both reliable and valid. Cronbach's Alpha coefficients for each scale

ranged between .87 to .96 with an aggregate scale of α = .99 which indicates strong internal consistency and stability in measurement. Although extremely high α values (especially above.90 and even a total α of.99) can indicate item redundancy in the scale, in this investigation, the high consistency somewhat reflects the stability of the original construct. Furthermore, the scale was content evaluated by specialists from the Department of Basic Education, Faculty of Educational Research, Universiti Putra Malaysia (UPM), before the questionnaire was distributed, guaranteeing its suitability and scientific validity. Respondents' mean scores on the scales showed an upward trend with satisfaction (ST), perceived usefulness (PE), and ease of use (EE) demonstrating high scores, revealing that the respondents had positive attitudes towards the experience, usefulness, and ease of online micro-credentials. While the mean scores for social influence (SI), facilitating conditions (FC), and continuing use intention (CI) were lower, these mean scores were still medium to high, suggesting the components are important for consideration in future study.

However, rather than offering definitive conclusions on student attitudes, these results are merely preliminary proof of the discrimination and reliability of the scale. Because of the small sample size, the main purposes of the study's findings are to assess the measuring performance of the instrument and serve as a guide for more extensive formal research in the future.

4. Conclusions

Rather than making firm judgements about student attitudes, the purpose of this exploratory study, which was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) and Expectancy-Confirmation Theory (ECT), was to evaluate the viability and reliability of a scale for gauging students' willingness to continue learning in the Malaysian higher education context.

All scales had high Cronbach's alpha coefficients (0.87–0.96, overall α =.99), according to the data, demonstrating great internal consistency and measurement stability. Additionally, each item produced a respectable answer variation throughout the student body, indicating acceptable discrimination and practical viability, according to frequency and percentage distributions.

While social influence (SI) and continued use intention (CI) showed relatively low results, other variables (such as satisfaction (ST), performance expectancy (PE), and effort expectancy (EE)) performed well in the descriptive results. However, these trends only offer initial indications of scale validity and should not be interpreted as generalizable, more thorough analysis will necessitate larger and more diverse samples.

To conclude, the principal outcomes of this study are to demonstrate the reliability of the scale, in the context of Malaysian higher education; to illustrate the capacity of the scale to differentiate between different constructs; and to serve as a methodological baseline for more extensive empirical studies in the future.

The results from this preliminary study cannot be generalized because the sample size consisted of only undergraduate students from one university. To refine the tool and broaden comprehension of students' experiences, future research should focus on larger and more diverse samples.

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