to the individual's performance. These two factors form the beliefs of a user when they first use the system, which in turn influence their "*Attitude Towards Using*" (AT) and "*Behavioral Intentions*" (BI). AT is the measurement of the desirability of the user to use the system while BI measures the strength of one's intention to perform a specified behaviour. Figure 14 shows the model that TAM has adopted.

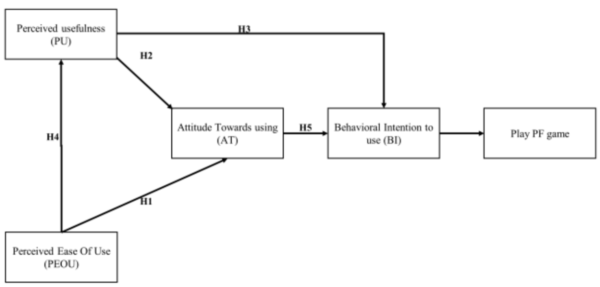

Figure 14: TAM study model

Based on the model, we can formulate up to five hypotheses. The hypotheses are as follows:

H1: PEOU will positively influence players' AT playing the game.

H2: PU will positively influence players' AT playing the game.

H3: PU will positively influence players' BI towards playing the game.

H4: PEOU will positively influence PU of the game

H5: AT the game will positively influence players' BI to play the game

6.2 Result Analysis

To test for the reliability and internal consistency of the survey for TAM analysis using Cronbach's coefficient alpha was used. A coefficient value of 0.7 to 0.90 was said to be acceptable, and anything above 0.90 could mean that there were redundant questions [Tavakol and Dennick 2011]. The results are shown in Table 4.

Table 4: Cronbach's coefficient alpha.

Factor	Number of Questions	Cronbach's Alpha
Perceived Ease of Use (PEOU)	7	0.766
Perceived Usefulness (PU)	6	0.955
Attitude Towards using (AT)	5	0.899
Behavioural Intention to use (BI)	2	0.833

The results are indeed satisfactory except for PU where the coefficient value is above 0.90; hence, there could be too many questions in the survey of the same purpose. The Pearson correlation is used to investigate the relationship between the four factors in the TAM. The coefficient ranges for -1 to 1, where a more positive value corresponds to a more positive association, vice versa. The results are collated, as in Table 5.

Table 5: Cronbach's coefficient alpha.

	PEOU	PU	AT	BI
PEOU	1	0.988	0.635	0.988
PU	0.988	1	0.652	0.991
AT	0.635	0.652	1	0.583
BI	0.988	0.991	0.583	1

The linear regression analysis was done to test the hypotheses. The results are depicted in Table 6. The perceived ease of use has the highest positive impact on the players' perceived usefulness of the game, with a standardized coefficient of 1.5. Additionally, it is significant with a relatively low p-value of 0.0015 (lesser than 0.05). The only other significant hypothesis is H3. Where the perceived usefulness will positively influence the players' behavioural intention to play the game again. It also has a relatively high level of impact with a standardized coefficient of 0.969 and a p-value of 0.001.

Table:6: Linear regression analysis.

Hypothesis	Standardized Coefficient	P-value
H1: PEOU will positively influence players' AT playing the game.	0.564	0.250
H2: PU will positively influence players' AT playing the game.	0.382	0.233
H3: PU will positively influence players' BI towards playing the game.	0.969	0.001
H4: PEOU will positively influence PU of the game	1.50	0.0015
H5: AT the game will positively influence players' BI to play the game.	0.972	0.302

6.3 Survey Discussion

Our experiment did not manage to find any significant correlation between PEOU and AT, PU and AT, AT and BI. This is likely, again due to the small sample size of our survey participants. To further understand the participant's sentiments about the experiment, similarly like before, we gathered some verbose feedback. One participant explained that after playing the game, it is easier to understand the instructions the lecturer explained. Another commented that even though he would not play the game on his own, he feels that the game should be incorporated into the course as self-learning material.

7 Conclusion and Future Work

In conclusion, the experiment has proved that the PF game has indeed played a part in improving students' learning experience. Although the experiment did not have many participants, it was able to point to the direction that the game was able to improve the learning outcome for CS concepts like a linked list. Of course, there will always be a bias where the participants who played the game were naturally more academically inclined into the subject. However, the groupings were already randomized to reduce such bias. In future experiments, we would have grouped them according to their grade point average (GPA). Furthermore, the game will be expanded to include more data structures like queues, stacks, and binary trees. An expanded gameplay idea will also be developed to accommodate other data structures. Additionally, we would try to simplify the entire experiment process in the hope of attracting more participants for possibly a future experiment to further substantiate the results.

The design of the game was approached in a different way compared to the others mentioned in the related work section. The game was developed based on practical questions on the linked list, which in turn was one of the challenges faced. However, this ensures that different application scenarios of the linked list are covered in the game. Failure has also become an integral part of the game with the application of PF. The failure aspect of the game is designed not to frustrate and demotivate; instead, it gives students a chance to review and try new solutions and help their problem-solving skills. We hope that the game will become instrumental in helping students become better achievers by providing them with an opportunity to learn more interestingly and engagingly.

ACKNOWLEDGMENTS

The research was supported by the Singapore Ministry of Education (MoE) Tertiary Education Research Fund (TRF) and the Centre for Augmented and Virtual Reality.

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