



MOOC Quality Design Criteria for Programming and Non-Programming Students

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Introduction

Part 01



Background

Problem Statement

- Many studies on MOOC (Massive Open Online Courses) focuses on the design quality criteria aspects **generally**
- There are **limited studies** on the design quality criteria for MOOC **Programming** courses





Background

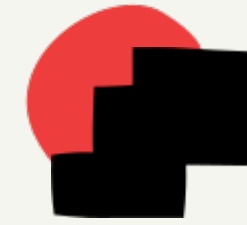
Literature REview

- Yousef et al. (2014) present specific criteria that need to be considered in designing and implementing MOOCs due to their unique features
- According to Wetzinger et al. (2018), there are three main elements that need to be focused on when developing a computer programming MOOC. First, the learning platform element should provide a well-maintained technical infrastructure and support. Second, the video lectures should be short and cover live programming examples while the handouts could consist of reading material in PDF format that explains the content of the videos and additional programming examples. Third, course materials and activities could comprise of exercises and quizzes, programming examples, glossary, graphical visualization, reference of common processing error messages, discussion forum, online office hours, and course email.
- Some studies on programming MOOCs (Vihavainen et al., 2012, Ruiz, 2015, Dale and Singer, 2019, Abeer and Miri, 2014) have started to look at instructional design features in-depth.





The Hypothesis



- **H1** - There is no difference in importance between non-programming student and programming student category towards **e-assessment (EA)** criteria
- **H2** - There is no difference in importance between non-programming student and programming student category towards **instructional design (ID)** criteria
- **H3** - There is no difference in importance between non-programming student and programming student category towards **technical design (TD)** criteria
- **H4** - There is no difference in importance between non-programming student and programming student category towards **user interface (UI)** criteria
- **H5** - There is no difference in importance between non-programming student and programming student category towards **video content (VC)** criteria
- **H6** - There is no difference in importance between non-programming student and programming student category towards **learning and social tools (LST)** criteria
- **H7** - There is no difference in importance between non-programming student and programming student category towards **learning analytics (LA)** criteria
- **H8** - There is no difference in importance between non-programming student and programming student category towards **lecture organization (LO)** criteria
- **H9** - There is no difference in importance between non-programming student and programming student category towards **culture (C)** criteria



Objective

What we want
to achieve

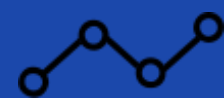
- To investigate the **design quality criteria and indicators for developing a MOOC** course for programming (P) and non-programming (NP) students
- To explore whether the **two categories of students (P & NP)** require similar quality design criteria to effectively engage in MOOCs





Methods
Part 02



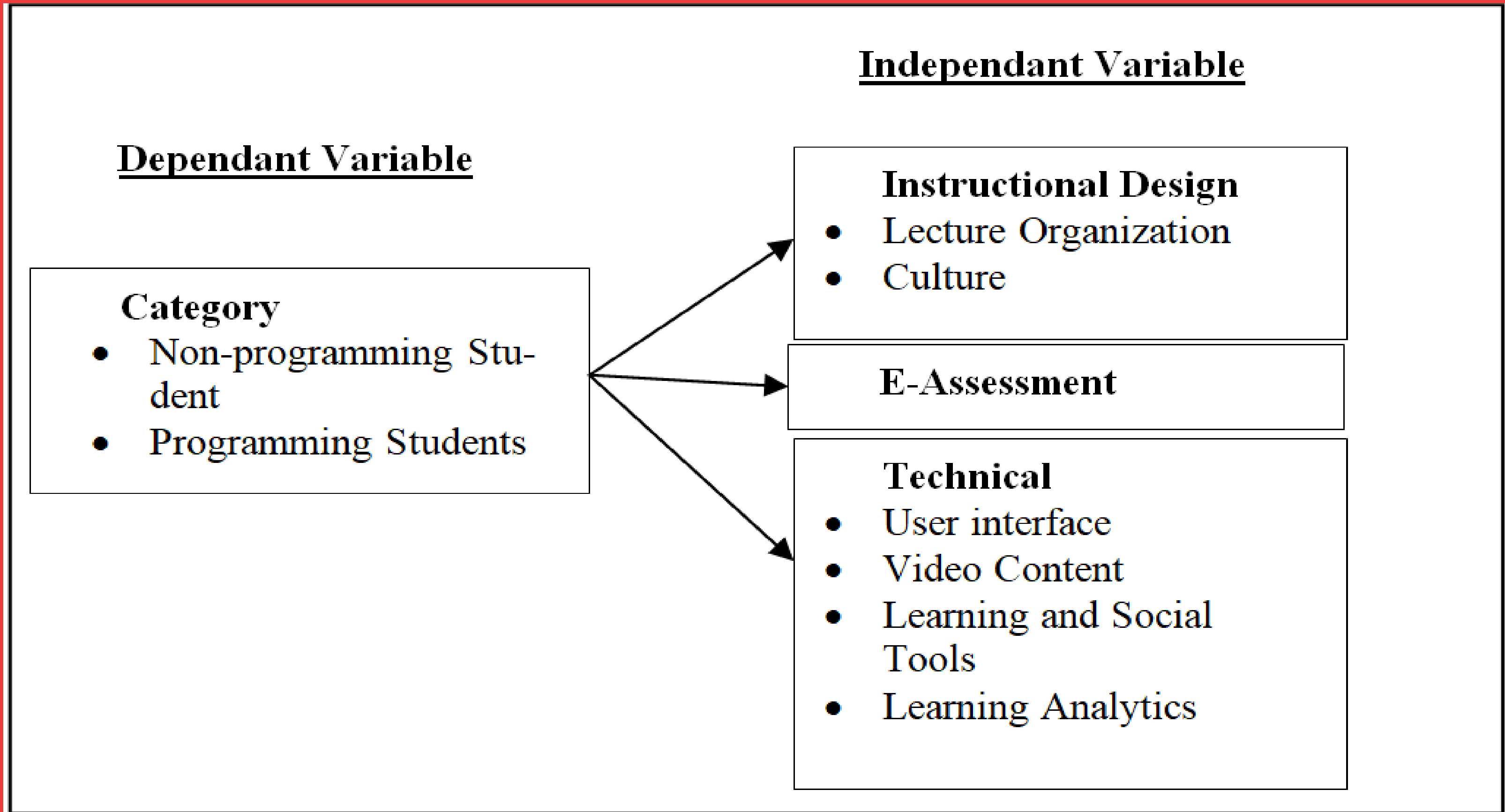


Overview of Research Methods

- Sample size : 306 respondents from UUM MOOC 2018 class student population
- Convenience sampling
- Data Collection & Instrument : Online questionnaire (60 questions) – adapted from Yousef, Shroeder and Wosnitza (2014) & Zhong (2016)
- 3 Sections (Section A: Demographic and Preferences, Section B: MOOC Design Quality Criteria and Section C: Challenges Faced by Learners to Complete a MOOC Course).



Theoretical Framework





Phases

Steps and Action Items

Step 01

Identifying the list of MOOCs criteria

Step 02

Designing and adapting the survey accordingly to the context of this study

Step 03

Collecting data and finally analyzing the survey result.





Results

Part 03



(Demographic & Preferences)

MOOC course currently attending	Frequency	Percent
Programming	155	50.7
Non Programming	151	49.3
Total	306	100.0
Gender	Frequency	Percent
Male	136	44.4
Female	170	55.6
Total	306	100.0
Nationality	Frequency	Percent
Malaysian	295	96.4
Others	11	3.6
Total	306	100.0
Have you ever taken a MOOC course?	Frequency	Percent
Yes	194	63.4
No	112	36.6
Total	306	100.0
If your university plans to implement MOOC, how much of face-to-face (f2f) vs online do you prefer?	Frequency	Percent
f2f 10 %: Online 90 %	29	9.5
f2f 20 %: Online 80 %	21	6.9
f2f 30 %: Online 70 %	23	7.5
f2f 40 %: Online 60 %	45	14.7
f2f 50 %: Online 50 %	80	26.1
f2f 60 %: Online 40 %	35	11.4
f2f 70 %: Online 30 %	29	9.5
f2f 80 %: Online 20 %	26	8.5
f2f 90 %: Online 10 %	18	5.9
Total	306	100.0





T-Test Result



Hypothesis t-test Results

There is difference in importance between programming **and** non programming student category towards **instructional design, e-assessment, culture **and** video content criteria**

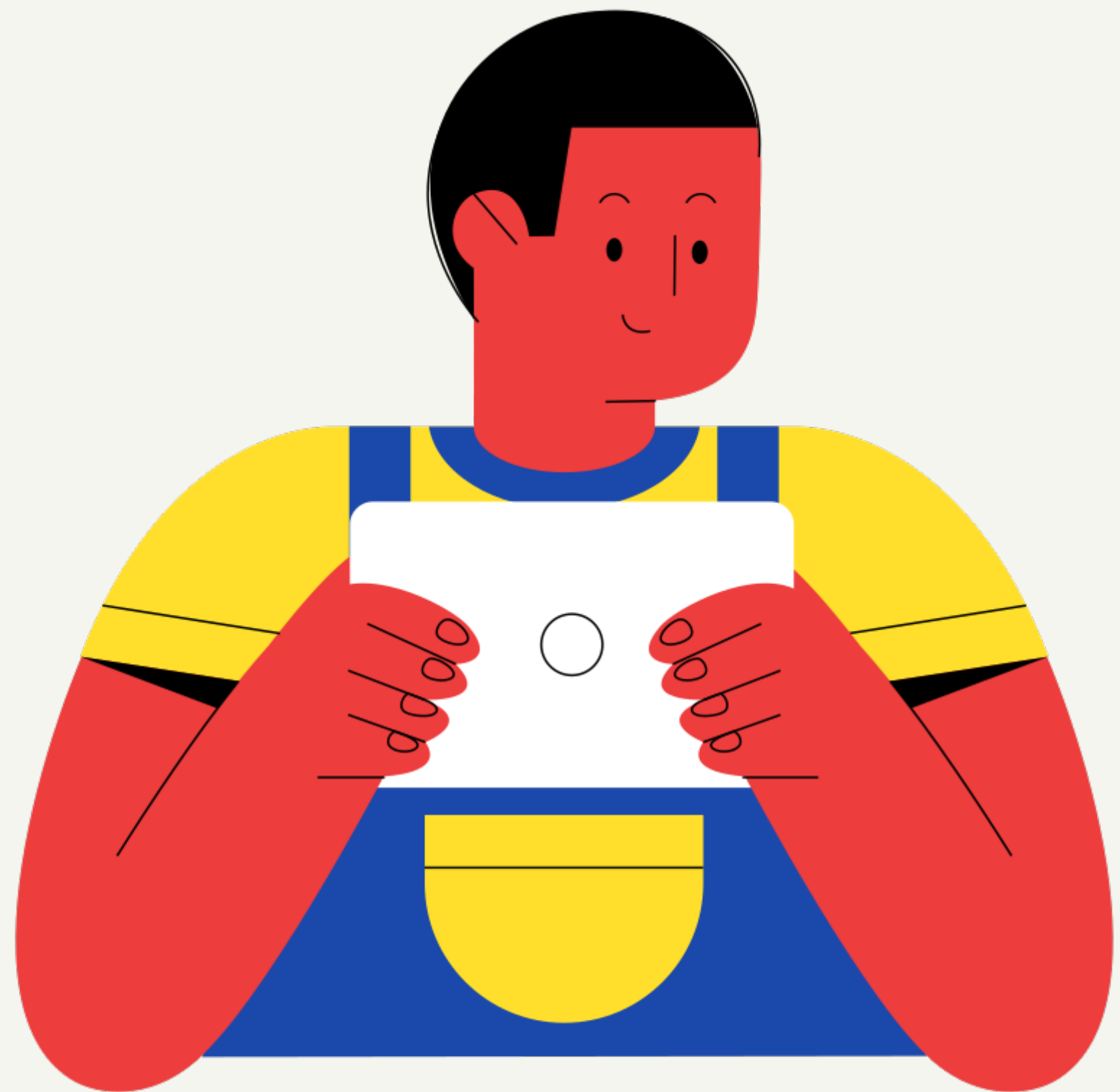
Null hypothesis for the 4 criteria is rejected

Constructs	Sig. (2-tailed) p value	Results
H1: P & NP → ID	0.033***	Not supported
H2: P & NP → EA	0.003***	Not supported
H3: P & NP → TD	0.068	Supported
H4: P & NP → LO	0.145	Supported
H5: P & NP → C	0.021***	Not supported
H6: P & NP → UI	0.175	Supported
H7: P & NP → VC	0.045***	Not supported
H8: P & NP → LST	0.122	Supported
H9: P & NP → LA	0.211	Supported





Conclusion
Part 04

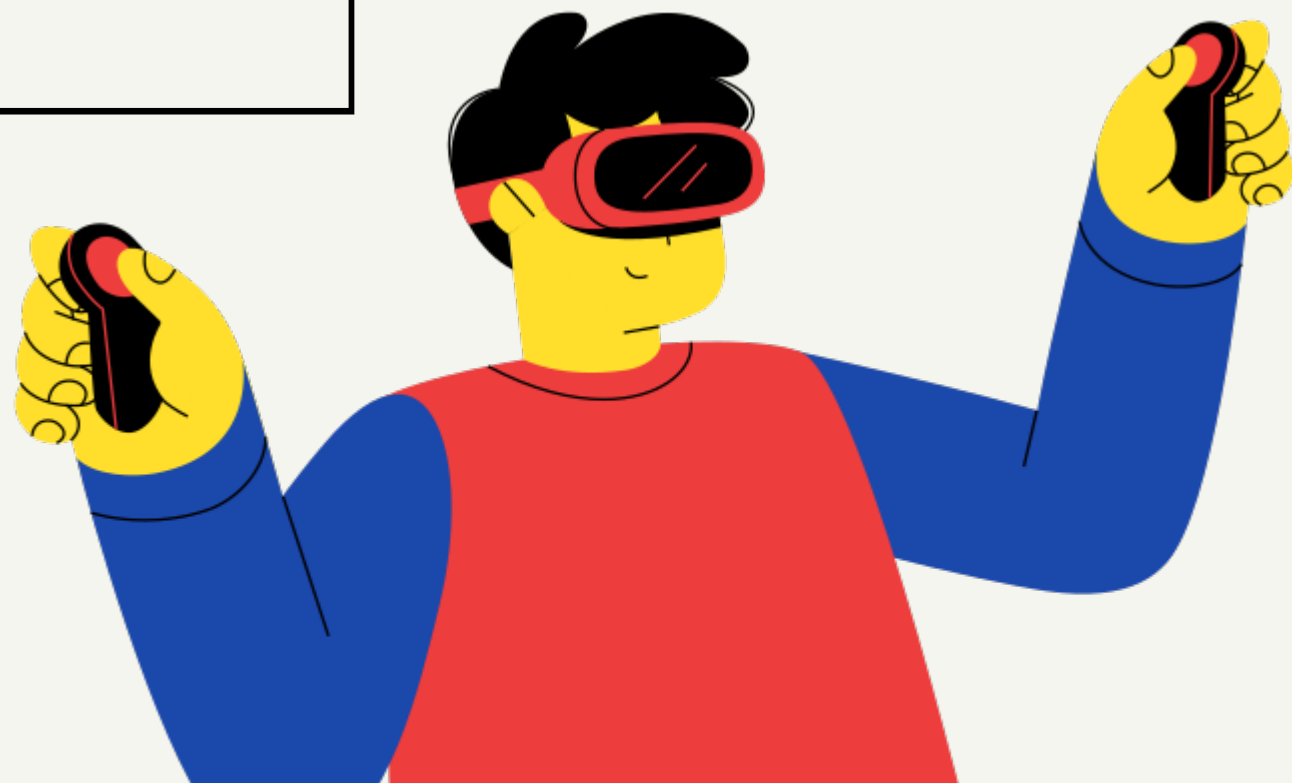


The result of this study is based on small scope of UUM MOOC student class of 2018.

The students was divided into two category of programming and non-programming student.

The statistical result of this study shows that the **Video Content, E-assessment, Instructional Design and Culture criteria** shows a different mean score value for programming and non-programming students.

- Programming students:
- **The form of exercises**
 - **Taught in most understandable form**
 - **Provide feedback on quizzes**
 - **Self-assessment features – hints & clues**
- Non- Programming students:
- **Short lectures - < 20 clips of VC**
 - **Provide course guideline**
 - **Diversity of the cultural values in the content of the video lectures**
 - **Hints on test**





Future works

Future studies could explore further other factors such as the respondents' demographic that could contribute to the differences in preference towards MOOC quality design criteria.

Furthermore, a bigger scope is particularly recommended to provide more holistic and comprehensive results.

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Thank you

