Student assessment of a questionnaire used during external master admission

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External students who apply to master's programmes at KTH are asked to fill in a digital questionnaire that summarizes their merits. Based on how they assess the clarity of questions from different master's programmes, we draw conclusions about best practices for posing these questions.

Background to the study

During master admission, applicants are asked to fill in a digital questionnaire. Within the DDMV project [1] which is part of the Future Education Framework at KTH [2], we have developed a standardized questionnaire structure that is used by several master's programmes at KTH.

- 29 Master's programmes
- 6381 Applicants

The standardized questionnaire format consists of two categories of questions.

- Common questions
- Programme specific questions

In this work, we analyse the answers to a final question about the clarity of the questionnaire.

Methodology and results

We consider the distribution of answers to the following question using a Likert scale

• How do you rate the clarity of the Summary sheet that your just filled in?
Excellent
Very good
Good
Reasonable
Bad
Very bad

For each master's programmes, a Wilcoxon rank sum test [3-4] is performed between the following two groups

- Answers from one programme
- Answers from all programmes

We used a $p<0{,}025$ criteria to reject the null hypothesis of equal distributions as indicated in the **Probability** column of Table 1. The **Side** column indicates if answers from one pprogramme is better, like the average or worse than answers from all programmes.

Programme	Probability	Side
TINNM	0,0034	
TMRSM	0,0034	Better
TTMAM	0,005	
TTEMM	0,007	than
TFORM	0,06	
TSUEM	0,17	average
TAEMM	0,22	
TCOMM	0,32	
TMLEM	0,67	
TTFYM	0,74	
TMVTM	0,8	
TDTNM	0,81	KTH
TNEEM	1	
TMMMM	0,94	Average
TJVTM	0,85	
TMBIM	0,71	
TEBSM	0,65	
TIDTM	0,55	
TCYSM	0,53	
TBDVM	0,53	
TxxxA	0,29	
TxxxB	0,24	
TxxxC	0,23	Less
TxxxD	0,17	
TxxxE	0,13	than
TxxxF	0,028	
TxxxG	0,026	average
TxxxH	0,0084	
TxxxI	0,000002	

Table 1. The probability for deviations between answers from one master's programme and answers from all 29 master's programmes.

Results and discussion

Differences between programmes comes from programme specific questions. A comparison of question types asked for each programme and the results of Table 1, shows the following correlations:

- Large number of questions about credits in specific courses is negative
- Large number of listings of key courses within a specific field is negative
- A question about additional information related to specific eligibility is positive

Since learning material is arranged and divided in different ways at different universities, it is also good practice to avoid referring to KTH course codes. Instead, it seems as it is better to explicitly write out the type of knowledge that is required.

All this reduces the applicant's cognitive load when tilling in the questionnaire.

Take home messages

Cognitive load must be made meaningful to students!

The DDMV project

The Data-Driven Merit Value (DDMV) project, gathers all information that is needed for the admission of external master students through a digital questionnaire filled in by the applicants.

By automatic data handling, we can quickly create a decision support for programme directors, which save considerable time.

- Usual assessment, 10-20 min/applicant
- DDMV assessment, 2-5 min/applicant

With about 20 000 assessed applicants per year at KTH in total, this may save the work of almost 2 full-time paid employees per year.

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[1] Data-driven assessment of qualifications to master's progammes, https://intra.kth.se/en/utbildning/framtidens-utbildning/aktiviteter/projekt/2023/datadriven-antagning-till-masterprogra

[2] Future education at KTH, https://intra.kth.se/en/utbildning/framtidens-utbildning

[3] Wilcoson, F., *Biometrics Bulletin* 1 (1945), p. 80-83.

[4] Mann, H.B, & Whitney, D.R., *Annals of Mathematical Statistics* 18 (1947,) p. 50-60.