

## Questionnaire

The questionnaire primarily assesses satisfaction with VSP. Following history-taking training with SP, both SP and VSP scores are simultaneously obtained, and participants provide feedback after comparing these scores. The questionnaire has been pre-investigated, and its validity and credibility are within acceptable range. The contents of the questionnaire are presented in [Table 11](#).

Table 11. The questionnaire content

| Questions                                                                               | Options                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Demographic Data                                                                     | Name, gender, age, birthplace,                                                                                                                                                                                                      |
| 2. Do you think this history-taking test reflects your true skill level?                | A. Absolutely; B. Mostly; C. A little; D. Not at all                                                                                                                                                                                |
| 3. What do you think of the device's speech recognition accuracy?                       | A. > 95%; B. 95%~80%; C. 80%~50%; D. < 50%                                                                                                                                                                                          |
| 4. Do you think virtual standardized patient can accurately understand your intentions? | A. Absolutely; B. Mostly; C. A little; D. Not at all                                                                                                                                                                                |
| 5. What do you think is inaccurate about grading skills?                                | A. Verification of citation; B. Chronological order; C. Interlanguage; D. Progress of history-taking; E. Question types; F. Avoid medical jargon; G. Organizing; H. Appearance and manners; I. Praise and encouragement; J. Summary |

Results were obtained from 97 questionnaires with a low recovery rate of 19.32% ([Figure 6](#)). Of the participants, twenty-nine (29.89%) thought that the history-taking test based on VSP could mostly reflect their true skill levels, whereas forty-seven (48.45%) thought that the test reflected their true skill level a little. Thirty-six participants (37.11%) said the device's speech recognition accuracy was above 80%, while thirty-seven participants (38.14%) thought it was over 95%. Sixty-five participants, or 67.01%, thought that VSP could mostly understand their intentions. According to the statistical results, students ranked the most inaccurate grading techniques in the following order: avoid medical jargon, summarization, question types, organization, and citation verification.



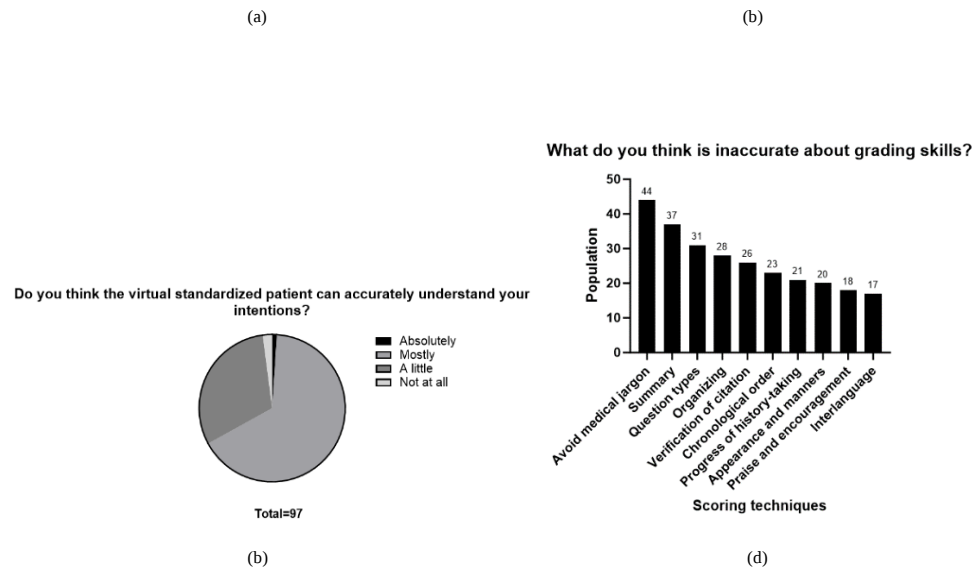


Figure 6. Questionnaire survey results (a) feedback results of the scoring questionnaire; (b) feedback from the speech recognition; (c) feedback results of intention recognition; (d) skill score feedback results.

Considering the limitations of SP, medical history-taking training is moving towards becoming more intelligent. After completing the tests, we conducted a questionnaire survey with the participants, and major results received positive feedback (Figure 6). Results from collected questionnaires showed that VSP performs reasonably well in both speech and intent recognition. 67.02% of participants said that most intents can be recognized accurately, while 75.25% thought that speech recognition accuracy is 80% or greater. However, 48.45% of participants felt that VSP can only barely reflect their true clinical history-taking skills. Participants thought that the most inaccurate contents of history-taking skills were avoiding medical jargon, summarizing, and question types. The reason may be the suboptimal accuracy and classification of intent recognition in VSP.