| DESIGN CONSTRAINTS | | LEVER | | INSTRUMENT STAND | | LARYNGOSCOPE CROSSWIRES | |
|---|---|---|---|---|---|---|---|
| C: Must not fall apart during surgery | | y | | y | | y | |
| C: Noncorrosive materials | | y | | y | | y | |
| C: Must withstand medical sterilization procedures (autoclave, enzymatic, bleach, etc.) | | y | | y | | y | |
| C: Cannot get in the way of surgical instruments | | y | | y | | y | |
| C: Cannot block the view of vocal cords | | y | | y | | y | |
| C: Materials must be compatible with human body | | y | | y | | y | |
| C: Must be easy to clean with conventional means (scrub brush, water jet, soaking, etc.) | | y | | y | | y | |
| C: Cannot cost more than $5,000 | | y | | y | | y | |
| **DESIGN OBJECTIVES** | Weight (%) | Score | Weighted Score | Score | Weighted Score | Score | Weighted Score |
| O: Structurally sound | 15 | 0.75 | 11.25 | 0.85 | 12.75 | 0.80 | 12.00 |
| O: Strong materials | 11 | 0.85 | 9.35 | 0.9 | 9.9 | 0.85 | 9.35 |
| O: Minimum obstruction of vocal cords | 29 | 1 | 29 | 1 | 29 | 0.65 | 18.85 |
| O: Minimum obstruction between patient and surgeon/nurse | 9 | 0.65 | 5.85 | 0.7 | 6.3 | 1 | 9 |
| O: Simple design | 2 | 0.6 | 1.2 | 0.7 | 1.4 | 0.9 | 1.8 |
| O: Minimum cost | 2 | 0.5 | 1 | 0.7 | 1.4 | 0.55 | 1.1 |
| O: Compatible with existing instruments | 10 | 0.3 | 3 | 0.8 | 8 | 0.5 | 5 |
| O: Minimal alteration of existing surgical procedures | 8 | 0.45 | 3.6 | 0.8 | 6.4 | 0.7 | 5.6 |
| O: Compatible with existing instruments | 8 | 0.3 | 2.4 | 0.85 | 6.8 | 0.8 | 6.4 |
| O: Simple mechanism | 6 | 0.7 | 4.2 | 0.6 | 3.6 | 0.95 | 5.7 |
| TOTAL | 100 | | 59.6 | | 72.8 | | 62.8 |

**FIGURE 2.8** A *decision* or *selection matrix* used by one of the student teams that worked on the microlaryngeal stabilization device to select a final design. The decision matrix, whose numbers should be taken with caution, suggests which designs are preferred. Adapted from (Chan et al., 2000).