Optimizing Multiple-Choice Assessment Checklist

Multiple choice questions (MCQs) or items are made up of a stem that presents a question or problem, as well as a set of answer options. The correct option is known as the keyed option, while incorrect options are called distractors. MCQs can be part of a valid and reliable assessment when written and evaluated effectively. Construction errors or item-writing flaws have the potential to reduce the reliability, validity, and accessibility of MCQs, disadvantaging some students more than others (Blendermann et al., 2020; Butler, 2018). Thankfully, the vast literature on this topic has yielded evidence-based guidelines for writing and evaluating the quality of MCQs (Cox, 2019; Gottlieb et al., 2022; Haladyna et al., 2002; Schneid et al., 2024).

This checklist presents evidence-based practices for optimizing multiple-choice questions. Stay tuned for a a more detailed explanation of each of these suggestions, which will be published as a Pressbook in spring of 2026!

- ✓ **Relevance with the Course**: Each MCQ should target specific knowledge relevant to the learning objectives of the course (Petrovic-Dzerdz, 2024). It is recommended that test-writers use the blueprinting technique to strategically sample content from a broad range of topics within the course curriculum (McCoubrie, 2009). Creating a test blueprint also ensures that student understanding is thoroughly assessed with questions of varying difficulty that target lower and higher-order learning (Petrovic-Dzerdz, 2024).

- ✓ **Clear, Precise and Concise Language**: Each MCQ should clearly and succinctly present a single question or problem in a way that can be easily understood (Gottlieb et al., 2022; Lopez, 2023). Test writers will have to strike a balance between detail, clarity, and brevity. They must convey enough information to support understanding, while avoiding "window dressing" (i.e., content that is not directly relevant to the item) and "red herrings" (i.e., content used to mislead the student) (Fulari & Rusert, 2024). In addition, students should not be expected to decipher subtext or make inferences, because the meaning of the stem, keyed option, and distractors should be unambiguous (Lopez, 2023; Tirado & Saldaña, 2016).

- ✓ **Plausible Distractors and Only One Correct Option**: All distractors should be plausible, but ultimately incorrect, based on the parameters of the stem (Jovanovska, 2018). Consider using common student misconceptions or mistakes as distractors. There should be only one correct option (i.e. the keyed option) and all other options should be plausible but incorrect.

- ✓ **Avoid Complex Multiple-Choice (CMC) Items**: For each MCQ, all answer options should be mutually exclusive and should not include combinations of answers. The CMC format (e.g., "A and B" or "A, B, and C, but not D")increases linguistic complexity and difficulty, but has no positive effect on discrimination value (Butler, 2018; Haladyna et

al., 2002). It also disadvantages vulnerable groups within the student population such as students learning English as an additional language and students with disabilities that impact information processing.

- ✓ **No AOTA or NOTA options**: Remove "all of the above" (AOTA) or "none of the above" (NOTA) options and potentially replace with a high-quality option. When AOTA is used as the keyed option, even poorly-prepared students can guess correctly with partial knowledge (Butler, 2018; Pachai et al., 2015). When AOTA is used as one of the distractors, it can be easily ruled out if students can identify at least one other option as incorrect (Dell & DeVries, 2024). Furthermore, findings indicate that using NOTA as the correct option significantly reduces the testing effect -- the potential for student learning to be enhanced by the assessment process (Blendermann et al., 2020; Butler, 2018; DiBattista et al., 2014; Odegard & Koen, 2007). Including NOTA in MCQs has also been shown to increase linguistic complexity and item difficulty while making no change to reliability and validity (Hammad, 2021; Hijji, 2017).

- ✓ **Avoid Negatives and Double Negatives**: The majority of MC assessment research suggests that the item stem should be phrased in the positive to facilitate comprehension (Haladyna et al., 2002; Jovanovska, 2018). Negative phrasing reduces clarity and creates unnecessary confusion for students. This is especially true when double negatives are used. Items that include negatives, such as *not* and *except*, may inadvertently measure reading proficiency or test-wiseness rather than students' understanding of the target content (Blendermann et al., 2020).

- ✓ **Assess Higher-Order Thinking**: MCQs have the potential to assess almost all levels within Bloom's Revised Taxonomy of Learning, from basic remembering to more advanced analysis and evaluation (Abdulghani et al., 2015; Anderson & Krathwohl, 2001; Brame, 2022). MCQs that present a novel scenario assess the student's ability to apply, analyze, and evaluate their knowledge of course content (Newton & Stoesz, 2024).

- ✓ **Keep Options Consistent**: Ensure that all options (i.e., distractors and keyed answer) are similar in length, format, and grammatical structure to avoid cueing the test-taker (Jovanovska, 2018). Be sure to check for typos in all options, because they can also contribute to cueing, especially when they appear in distractors (Schneid et al., 2024).

- ✓ **Limit the Number of Options**: Each MCQ should have a minimum of three and a maximum of four answer options, including the keyed answer and distractors. In a systematic review of the literature, Vyas and Supe (2008) found that three-option items (i.e., two distractors and one correct answer) had similar psychometric properties compared to four and five-option items. Creating three-option items increases the efficiency of test-writing because fewer distractors are needed, and this, in turn, makes it easier to avoid item-writing flaws that can introduce confounds (Raymond et al., 2019).

- ✓ **Review and Revise**: Consider presenting your MCQs to a peer and asking for feedback before administering the test (Wallach et al., 2006). After grading, complete item and

distractor analyses to check item difficulty and discrimination values, which can reveal item-writing flaws, mis-keyed items and problematic distractors (Jovanovska, 2018).

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