Putting Software Testing Terminology to the Test

M.A.Sc. Seminar

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The Need for Standardized Terminology

- Engineering is applied science
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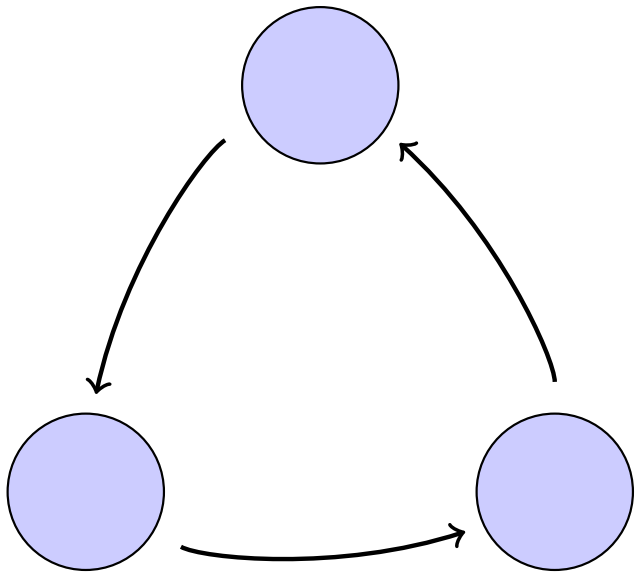
If software engineering holds code to high standards of clarity, consistency, and robustness, the same should apply to its supporting literature!

Improved Communication

Interorganizational

Schools, companies, etc.



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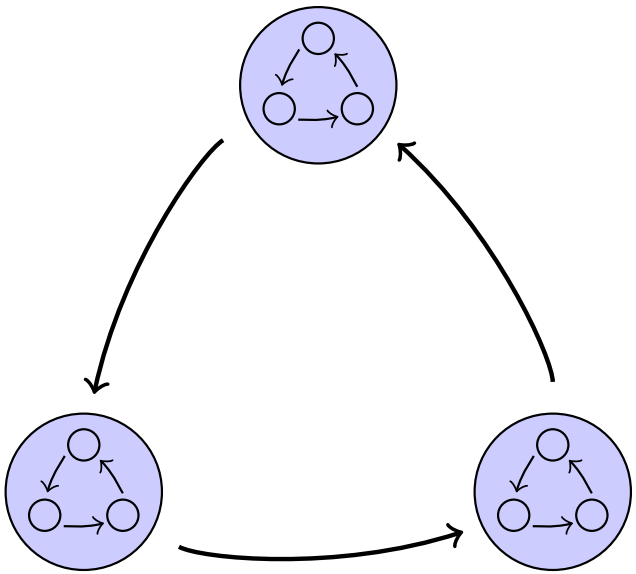

Intraorganizational

Kaner et al. (2011, p. 7) say "complete testing" could require the tester to:

- discover "every bug",
- exhaust the time allocated,
- implement every planned test,
- ...

The Lack of Standardized Terminology

"The Problem"

- Unfortunately, a search for a systematic, rigorous, and complete taxonomy for software testing revealed that the existing ones are inadequate:
  - Tebes et al. (2020) focus on *parts* of the testing process (e.g., test goal, testable entity),
  - Souza et al. (2017) prioritize organizing testing approaches over defining them, and
  - Unterkalmsteiner et al. (2014) focus on the "information linkage or transfer" (p. A:6) between requirements engineering and software testing.

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  - “organized around a special focus” (Hamburg and Mogyorodi, 2024)

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- Load testing is performed with:
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- Load testing is performed with:
  - loads "between anticipated conditions of low, typical, and peak usage" (ISO/IEC and IEEE, 2022, p. 5)
  - loads that are as large as possible (Patton, 2006, p. 86)

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"Okay testing team, we want to conduct alpha testing on our product. What's our timeline? Budget? Sample size?"

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Research Questions

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Research Question 3

Is it possible to resolve/reduce any of these discrepancies systematically?

Research Questions

Research Question 1

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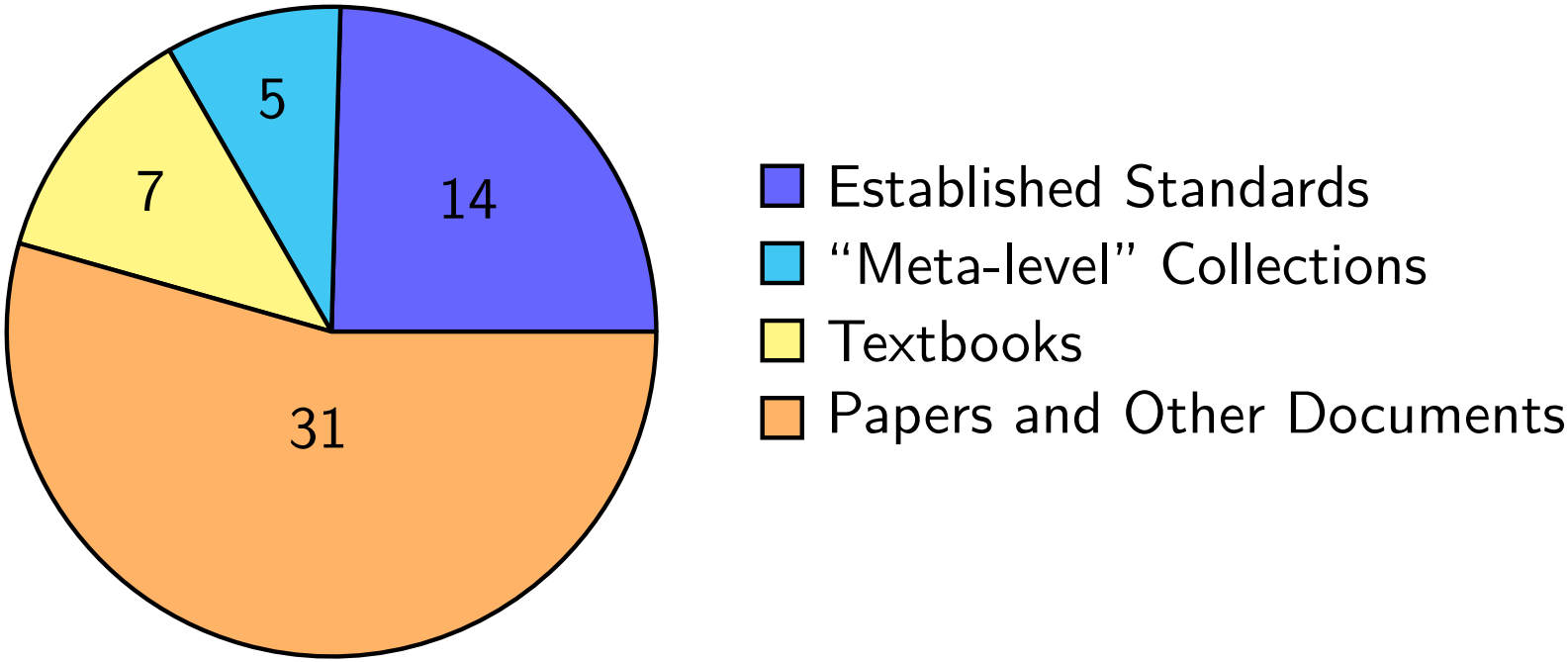
Literature Review Time!

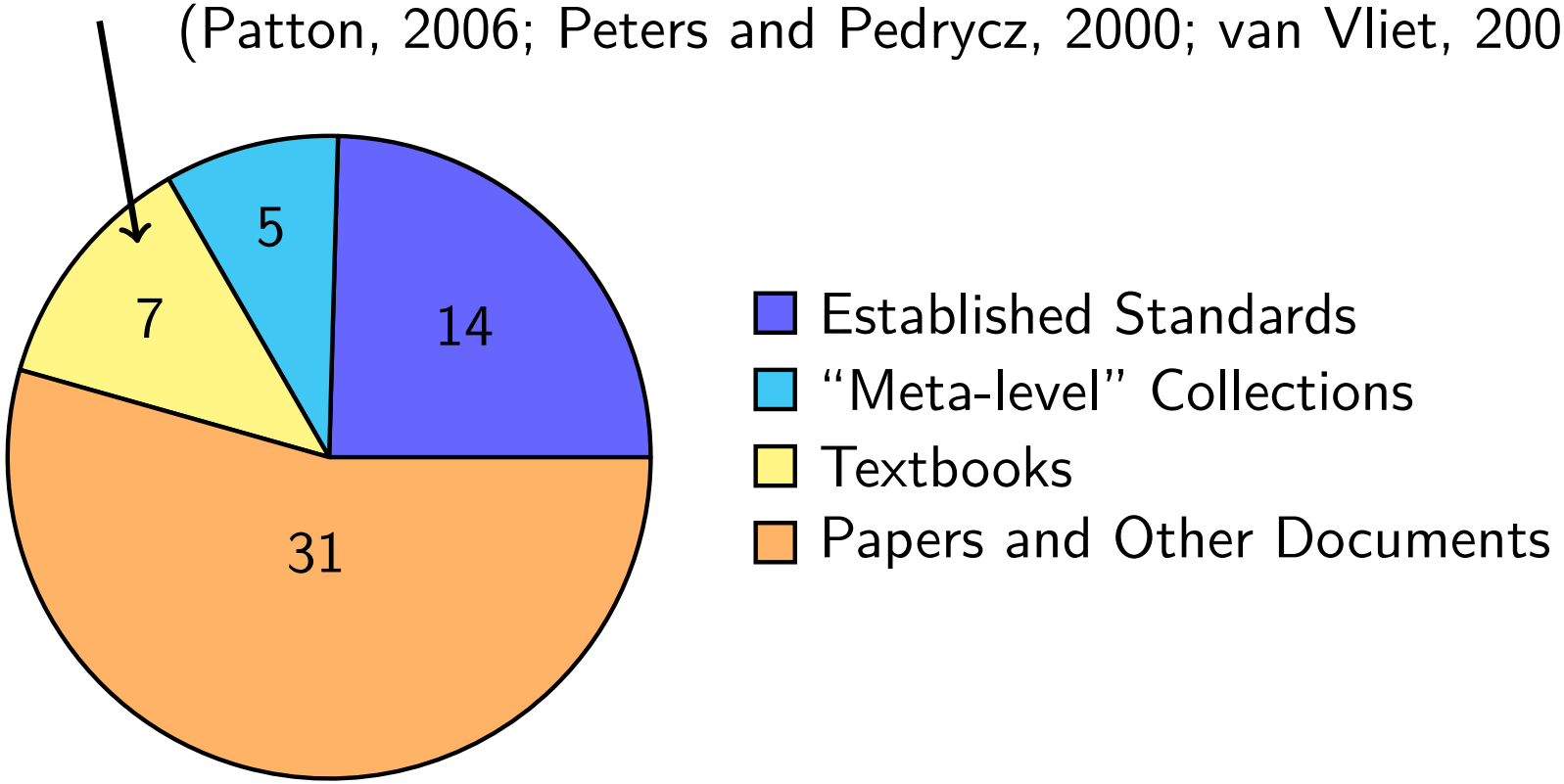
Methodology: Sources



Summary of how many sources comprise each source category.

Methodology: Sources

Textbooks trusted at McMaster were our ad hoc starting points (Patton, 2006; Peters and Pedrycz, 2000; van Vliet, 2000)



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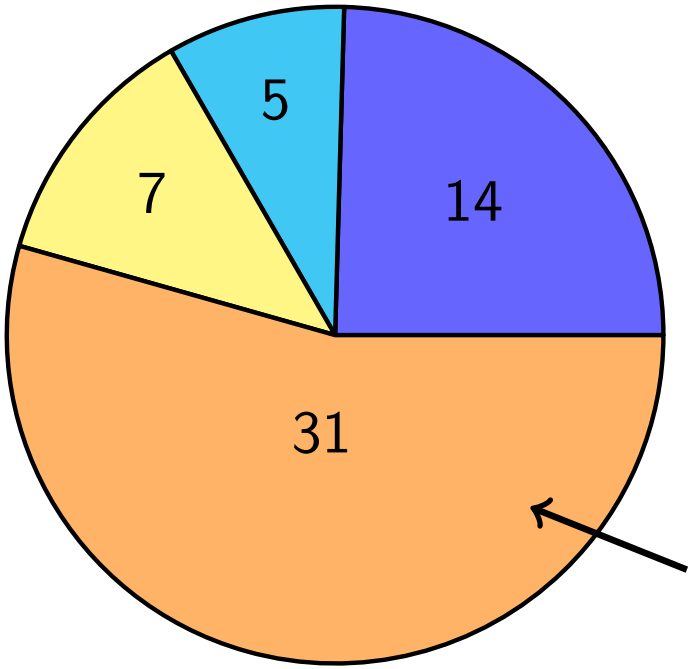


- Established Standards
- "Meta-level" Collections
- Textbooks
- Papers and Other Documents

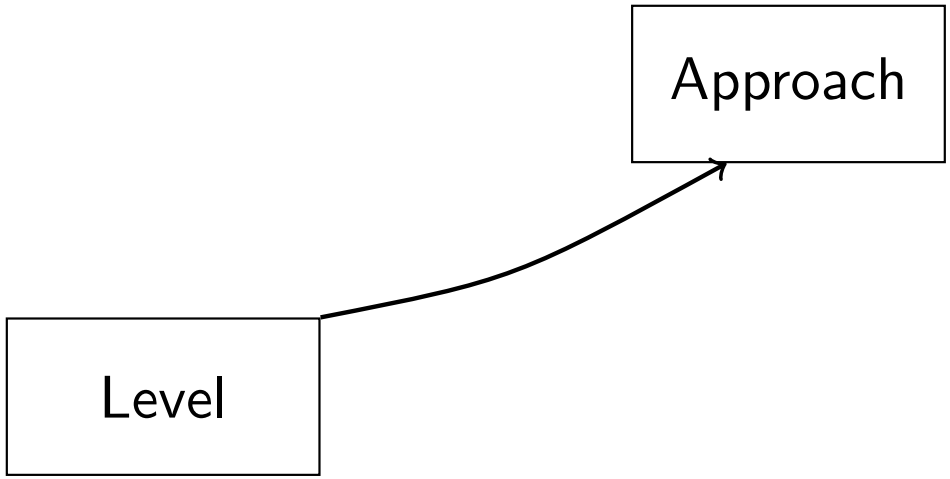
Includes websites (LambdaTest, 2024; Pandey, 2023) and a booklet (Knüvener Mackert GmbH, 2022)

Summary of how many sources comprise each source category.

Categorization Terminology

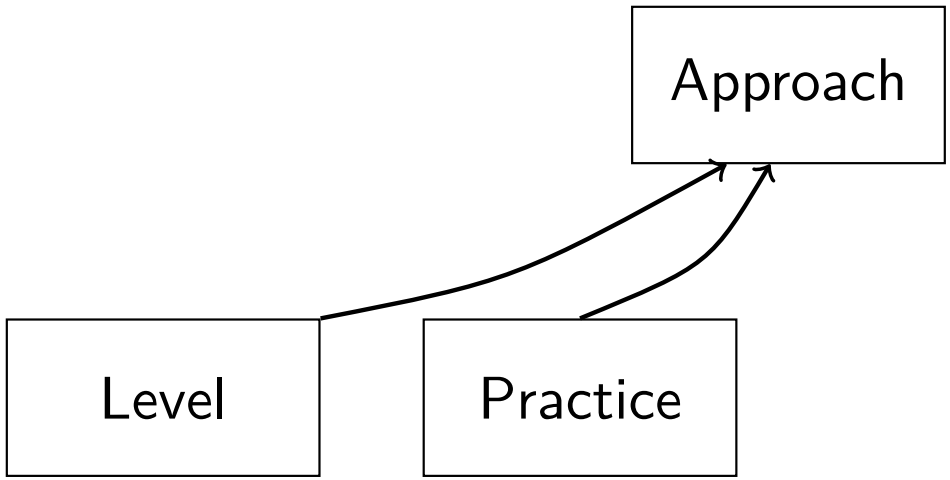
Approach: a "high-level test implementation choice" (ISO/IEC and IEEE, 2022, p. 10) used to "pick the particular test case values" (2017, p. 465)

Categorization Terminology



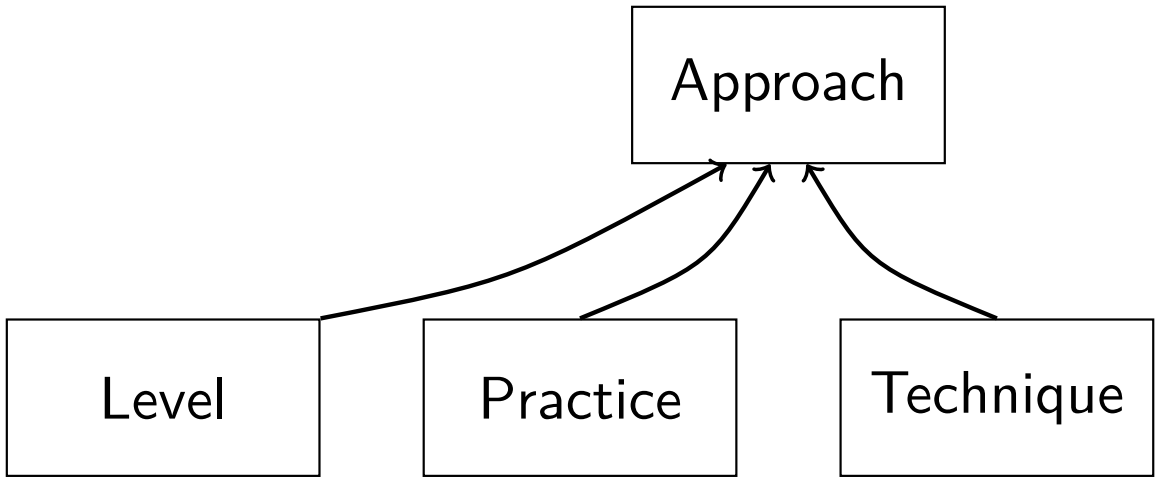
Level: a stage of testing with "particular objectives and . . . risks", each performed in sequence (ISO/IEC and IEEE, 2022, p. 12; 2021, p. 6)

Categorization Terminology



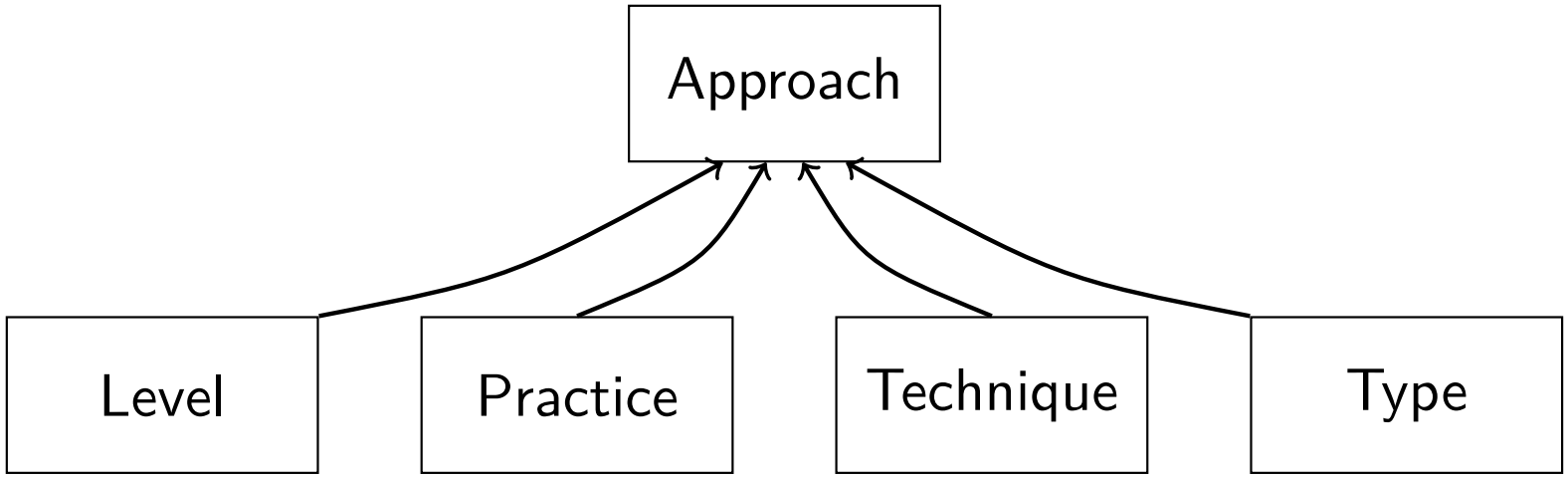
Practice: a "conceptual framework that can be applied to . . . [a] test process to facilitate testing" (ISO/IEC and IEEE, 2022, p. 14; 2017, p. 471)

Categorization Terminology



Technique: a "defined" and "systematic" (ISO/IEC and IEEE, 2017, p. 464) "procedure used to create or select a test model, identify test coverage items, and derive corresponding test cases" (2022, p. 11)

Categorization Terminology



Type: "Testing that is focused on specific quality characteristics" (ISO/IEC and IEEE, 2022, p. 15; 2021, p. 7; 2017, p. 473)

Acknowledgment

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- The past and current Drasil team have created a truly amazing framework!

Thank you!

Questions?

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