

Quality Study on Formative and Summative Assessment Strategies for ... Muhanguzi, J., Et. al., (2025)

DOI: <https://doi.org/10.64348/zije.20255>

## Qualitative Study on Formative and Summative Assessment Strategies for Effective Learning Outcome among Pharmacy Students: A Systematic Review

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### Abstract

*Evaluating pharmacy students effectively ensures they acquire the necessary knowledge, skills, and competencies for professional practice. This study explores the formative and summative assessments as key strategies in pharmacy student evaluation. Formative assessments provide ongoing feedback and support skill development, employing methods such as quizzes, in-class activities, and peer assessments to enhance student engagement and learning outcomes. Summative assessments, including standardized tests and final exams, offer a comprehensive measure of student competence and readiness for professional practice. Both assessment types have distinct benefits and challenges: formative assessments are time-*

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*consuming yet foster continuous improvement, while summative assessments offer standardization but can induce stress. Integrating both strategies provides a balanced evaluation system, supporting academic excellence and professional readiness. This review highlights the importance of ongoing research to develop more sensitive and accurate analytical techniques, optimize assessment integration, and address existing challenges to enhance the effectiveness of pharmacy education. Recommendations were also made.*

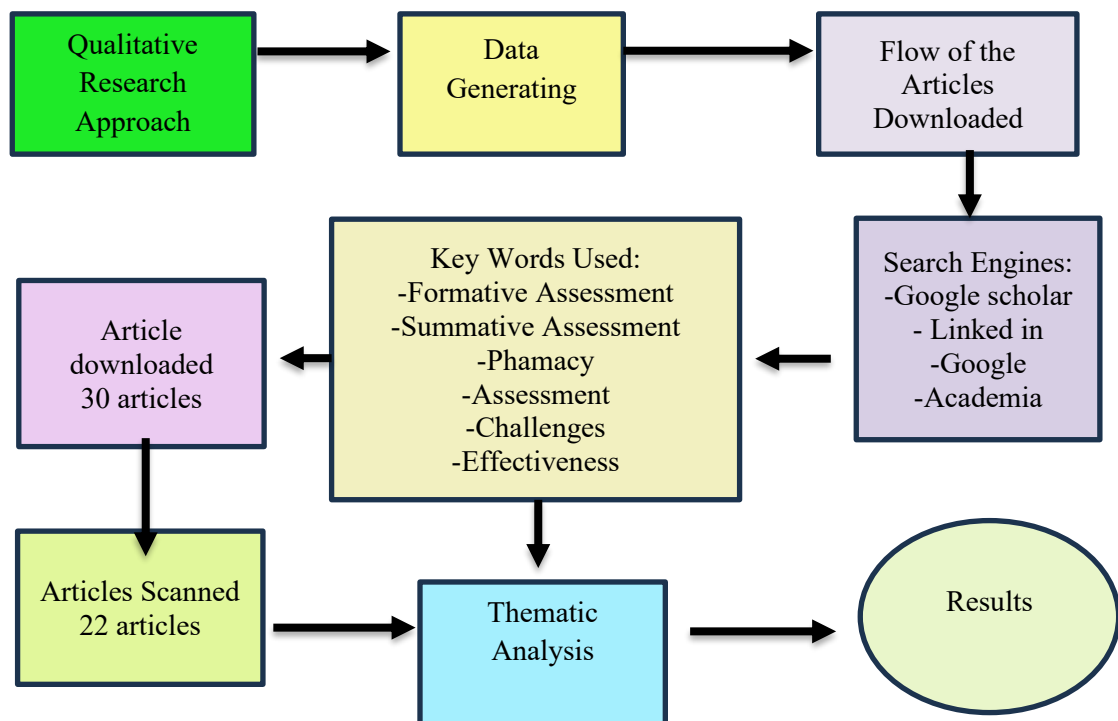
**Keywords:** Formative Assessment, Summative Assessment, Pharmacy, Assessment, Academic Performance

## Introduction

The evaluation of pharmacy students is critical for ensuring they acquire the knowledge, skills, and competencies required for professional practice. Formative and summative assessments are two primary strategies for evaluating pharmacy students' academic performance and progress (Gezer et al., 2021). Moreover, formative assessment is an ongoing process that provides feedback to students and instructors about pharmacy student learning progress. It aims to identify areas where pharmacy students need improvement and to inform instructional strategies. (Sottiyotin et al., 2023). Summative assessment, on the other hand, is used to evaluate pharmacy student learning at the end of an instructional period. It typically involves standardized tests, final exams, and other high-stakes assessments that determine student grades and academic achievement (Al-Worafi, 2023). Thus, this study aims to explore the theoretical foundations, methodologies, and effectiveness of formative and summative assessments in the context of pharmacy education. The review also examined the benefits and challenges associated with these assessment strategies and their impact on pharmacy student learning and development.

## Methodology

The methodology of the study is described in Figure 1 below:



**Figure 1. Flow of the Methodology of the Study**  
**Presentation of Results**

The two forms of assessments (formative and summative) are applicable to pharmacy lessons for better learning outcomes as indicated in Tables 1 and 2.

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Formative assessments can take various forms, including quizzes, in-class activities, peer assessments, self-assessments, and reflective journals. These assessments are designed to provide immediate feedback and promote active learning. (Croft et al., 2019). Studies have shown that formative assessments enhance pharmacy student engagement, motivation, and self-regulated learning. (Sottiyotin et al., 2023). This kind of evaluation can be used to assess pharmacy students in some ways, for instance, in topics such as detoxification, Deoxyribonucleic Acid (DNA) Screening, and Sterilization as described in Table 1 below.

**Table 1. Examples of Formative Assessment in Pharmacy**

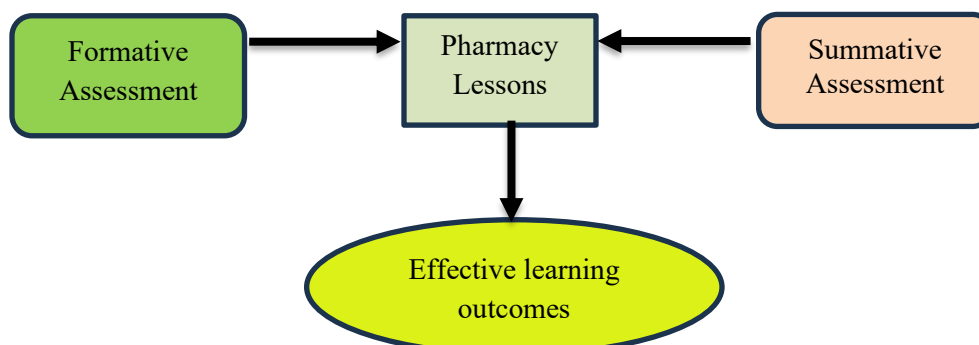
S/N	Topic	Formative Assessment Questions
1.	Detoxification	1. The students should define detoxification's concept: What is detoxification? 2. How is the detoxification of alcohol poisoning carried out in general? If the students' responses are positive then the lecturer could proceed with the lecture
2.	Deoxyribonucleic Acid (DNA) Screening	1. Pause and reflect on what has just been covered in the lecture e.g. assuming you have been appointed by Uganda national laboratories, what precautions must be taken to avoid contamination of evidence containing DNA while collecting it from the crime scene? 2. what are the steps followed while DNA testing? Based on the pharmacy students' responses, identify their areas of strength and weaknesses, provide feedback, and improve.
3.	Sterilization.	1. How can you sterilize the equipment that is heat labile? 2. What are the recommended conditions for sterilizing the infusions, injectables, and syringes? To proceed with the lecture, the instructor must ensure the students have given positive answers.

Summative assessments include traditional exams, objective structured clinical examinations (OSCEs), practical assessments, and standardized tests. These assessments aim to measure pharmacy student competence and readiness for professional practice. (Gezer et al., 2021). Research indicates that summative assessments provide a comprehensive evaluation of pharmacy student performance and are essential for ensuring academic standards. (Karaman, 2021). This type of evaluation (Summative) can be used to assess pharmacy students in some ways, for instance, in all topics such as Detoxification, Deoxyribonucleic Acid Screening, and Sterilization at the end of a course e.g. end of semester exams. This will cover all the topics taught in the course units. The examples of summative assessment in relation to pharmacy can be seen table 2 below.

**Table 2. Example of Summative Assessment in Pharmacy**

S/N	Course unit	Summative assessment questions
1	Pharmacy law and ethics	1. What are the legal requirements for dispensing controlled substances in a pharmacy, how do they differ from non-controlled substances? 2. Discuss the ethical considerations a pharmacist must take into account when dealing with patients' confidential information. 3. Explain the pharmacist's role in ensuring the medication safety and preventing medication errors. What legal responsibilities do they have in this regard?
2	Pharmacognosy II	1. Describe the biological source, chemical constituents, and therapeutic uses of digitalis 2. Explain the significance of the acetate pathway in the biosynthesis of secondary metabolites
3	Pharmaceutics II	1. Describe the different methods of tablet manufacturing. How does each method impact the final product's quality and efficacy? 2. Discuss the role of excipients in pharmaceutical formulations. Provide examples of common excipients and their specific functions.

Furthermore, the connection between formative and summative assessments and pharmacy lessons for desired learning outcomes is described in Figure 1 below:



**Figure 1.** Connection Between Formative Summative Assessments and Pharmacy Lessons for Desired Learning Outcomes

### Effectiveness of Formative Assessments

Formative assessments are highly effective in improving pharmacy student learning outcomes. They provide opportunities for pharmacy students to practice and refine their skills, receive constructive feedback, and adjust their learning strategies (Karaman, 2021). Evidence suggests that formative assessments contribute to deeper understanding and retention of knowledge (Skills, 2018).

### Effectiveness of Summative Assessments

Summative assessments are crucial for certifying student competence and providing a final measure of their academic achievement. They offer a structured and standardized approach to evaluation, ensuring consistency and fairness. Summative assessments are also valuable for identifying high-performing pharmacy students and areas where the curriculum may need improvement (Brown, 2022).

### Benefits of Formative Assessments (Dayal, 2021)

1. **Continuous Feedback:** Formative assessments offer real-time feedback, allowing pharmacy students to address their weaknesses promptly.
2. **Engagement and Motivation:** These assessments encourage active participation and motivate pharmacy students to take ownership of their learning.
3. **Skill Development:** Formative assessments support the development of critical thinking, problem-solving, and self-assessment skills particularly in pharmacy lessons.

### Challenges of Formative Assessments (Karaçöp & İnaltekin, 2023)

1. **Time-Consuming:** Implementing formative assessments requires significant time and effort from instructors.
2. **Subjectivity:** There can be variability in the interpretation and use of formative feedback.
3. **Resource Intensive:** Effective formative assessments may require additional resources and support.

### Benefits of Summative Assessments (French et al., 2024)

1. **Standardization:** Summative assessments provide a uniform measure of pharmacy student performance, ensuring consistency.
2. **Comprehensive Evaluation:** These assessments offer a holistic view of pharmacy student competence and readiness for professional practice.
3. **Accountability:** Summative assessments hold students accountable for their learning and performance.

### Challenges of Summative Assessments (Bennett, 2011)

1. **High Stakes:** Summative assessments can induce anxiety and stress among pharmacy students.
2. **Limited Feedback:** These assessments often provide limited feedback, reducing opportunities for improvement.
3. **Potential Bias:** There can be biases in the design and administration of summative assessments.

### Impact on Student Learning Outcomes and Development

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The combination of formative and summative assessments creates a balanced evaluation system that supports pharmacy student learning and development. While formative assessments foster continuous improvement and pharmaceutical skill development, summative assessments validate pharmacy student competence and academic achievement (Karaçöp & İnaltekin, 2023). Integrating both assessment strategies ensures a comprehensive evaluation framework that promotes academic excellence and pharmacy professional readiness (Brown, 2022).

## Conclusion

Formative and summative assessments are integral to evaluating pharmacy students' academic performance and progress (French et al., 2024). Each assessment strategy has its unique strengths and challenges, and their combined use offers a balanced approach to pharmacy student evaluation. Formative assessments provide continuous feedback, foster engagement, and support skill development, while summative assessments ensure standardization, comprehensive evaluation, and accountability (Taras, 2009). Future research should focus on optimizing the integration of formative and summative assessments to enhance their effectiveness and address existing challenges. By leveraging the strengths of both assessment strategies, pharmacy educators can create a robust evaluation system that promotes pharmacy student learning, development, and professional competence.

## Recommendations

In order to enhance student learning outcomes and offer suggestions for further research, it has been suggested that:

1. Educators including those in pharmacy be encouraged to use a variety of evaluation techniques.
2. Instructors should explore the use of formative and summative assessments for enhanced and achieve effective learning outcomes in pharmacy lessons.

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