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Teacher Educators' Self-Efficacy Towards Open-Book Examinations

Ajit Kumar Singh

Research Scholar, Department of Education, Aligarh Muslim University, Aligarh, U.P. 202001

Abstract

The goal of an examination is to evaluate learning outcomes. However, traditional education systems evaluate mainly lower-order skills compared to higher-order skills. NEP 2020 focuses on the development of higher-order cognitive skills. Therefore, NEP 2020 speculates that curriculum, pedagogy, and assessment may inculcate creativity, critical thinking, higher-order thinking, and problem-solving abilities among students. Therefore, an evaluation system that could evaluate and ensure the achievement of higher-order skills needs to be adopted. An open-book exam is an approach that shifts the focus from memorization to deeper understanding, in which the assessment focuses on assessing the application of knowledge in real-world contexts. Particularly at the higher education level, encourage students to engage more critically with learning materials. Although, teacher educators had not real experiences about open book examinations but their extensive teaching experience, proper knowledge of philosophy, modus of operandi of open-book exams and online assessments during COVID 19 provided a relevant foundation to explore perceived self-efficacy towards adopting open book examinations. An online survey was conducted on the teacher educators from the Department of Education. The study found that teacher educators possess a favorable perception of open-book exams and suggest that the organization of training programs to strengthen their competencies in aligning assessment with learning outcomes and integrating digital tools meaningfully.

Keywords: Open-Book Exam, Higher-order Skills, Higher Education, Traditional Evaluation System, Outcome-Based Education

1. Introduction

Outcome signal about the demonstration of lear ned behavior at the end of a course. Evaluation is an imperative process and a rational act for acknowledging the accomplishment of outcomes (Mahmoudzadeh, 2015). Whereas an assessment is conducted to measure the extent of learned behavior. Hence, the grade in the examination reflects the learners' achievement. The selection of assessment methods depends on the predetermined course goal**.** The assessment approach is indeed necessary in the 21st century, which would help individuals acquire 21st-century skills. The skills that are already predetermined. Furthermore, the United Nations, through Sustainable Development Goal (SDG) 4 on quality education, highlights the importance of learning outcomes along with effective teaching and learning methods (Mahrishi et al., 2025). The objective is to ensure that every student gains meaningful and applicable knowledge, while also ensuring that educators possess the necessary skills to deliver high-quality education. Hence, the educational process should be outcome-oriented. i.e., outcome-based education. The term "outcome-based education" was coined by William G. Spady in 1988, marking a

significant change in the educational process. In this, education is result-oriented, where the educational process is guided by outcomes, whereas in input-oriented (traditional) education, the focus is on the educational process itself, regardless of the results. Through outcome-based education, we require equip teachers with the essential skills that enhances conceptual understanding among the students necessary to address the complex issues of our world and play an active role in creating a fairer and more sustainable society (Mahrishi et al., 2025). For this teachers educators' readiness for open-book examinations can be significant and assessed through perceived self-efficacy, as proposed in Bandura's social cognitive framework (1997). self-efficacy beliefs precede and influence the adoption of new pedagogical practices.

1.1 Importance of assessment in confirmation of learning outcomes

Philosophical and theoretical beliefs about traditional and alternative assessment provide significant reasons for shifting from traditional to alternative assessment. In the current education system, knowledge is assumed to have multiple meanings. Students learn through experiences where process is given equal importance to outcome. Assessment not only focuses on recalling bits of information but also promotes habits of inquiry and facilitates learning. Unlike traditional assessments, it does not distinguish between students who know and those who do not. Assessment is viewed as subjective and involves the overall measurement of cognitive, affective, and motor skills simultaneously (Rebecca).

Teacher-focused learning audits the learning, whereas learner-focused learning drives the learning process, motivates, and empowers the students. This difference affects the assessment process, for example, assessment of learning (summative assessment), assessment for learning (assessment that guides student learning and improves progress), and assessment as learning (where students monitor their own learning progress) (Stiggins, 2005). In comparison, Harden and Lilley (2025) identified seven key dimensions within the assessment framework PROFILE, which include: Program-focused, Real-world relevance, Outcome-based design, Learning-oriented approach, Impact measurement, Learner engagement, and Evaluation. Therefore, the evaluation system can only measure genuine learning. Simultaneously, there is a need to change the social meaning of evaluation to make assessment more informative and insightful. Thus, the classroom environment should have a more interactive approach to learning, such as Feedback, self-assessment, dynamic assessment, and open-book exams, which are some examples (Shepard, 2000). An open-book exam is a contentious issue in the teaching and learning process. Theophilides and Koutselini (2000) conducted a study which examined students' behaviours during closed-book and open-book examinations. The study revealed that students preparing for closed-book exams primarily concentrated on memorising facts, focusing on details, studying only assigned materials, using surface-level learning strategies, and often delaying preparation until the end of the semester. In contrast, students preparing for open-book exams emphasised higher-order thinking, practised practical study skills, engaged deeply with the course content, explored materials beyond the required readings, and integrated knowledge from various sources. Therefore, an open-book examination may be one way to ensure the achievement of higher-order skills, which necessitate a shift from the traditional education system to an outcome-based education system.

1.2 Traditional Education System and Outcome-Based Education System

In the traditional education system, the teacher led the instruction to transmit the fixed curriculum. The student memorizes the curriculum to pass. Traditional assessment methods help in evaluating lower levels of Bloom's taxonomy. It primarily focuses on the input process, so most questions begin with keywords such as define, explain, list, describe, and differentiate to assess the extent to which students have acquired the knowledge (Prasad, 2018). Whereas an outcome-based education system focuses on the product, all

educational activities must be aligned with the learning outcomes of the course. It helps to improve learning and achieve course outcomes by demanding higher Bloom's level questions to evaluate learning (Prasad, 2018). Therefore, in this evaluation system, examinations need to be integrated into classroom learning and made more flexible to monitor and achieve predetermined outcomes. Therefore, a standardized assessment approach may not be suitable when learning is guided by assessment to achieve a predetermined product (Crespo, 2020).

Hence, clarity of purpose must prevail regarding what students can do at the end of the course, which is defined in terms of measurable and observable outcomes. Viz., Course Outcomes (CO at the end of the program), Program Outcomes (PO evaluated at the time of graduation) and Program Specific Outcomes (PSOs).

An outcome-based education system is not limited to a single specified style of teaching and learning. Instead, this approach considers and focuses on the outcomes that students would achieve. Furthermore, it allows flexibility in learning paths, self-pacing and assessment. Assessment in Outcome-Based Education differs in terms of grading, where student scores are arranged from best to worst. An open-book exam might be an alternative assessment tool, where the outcome is less tangible and is typically expressed in terms of what students know, can do, or have become as a result of their education.

Table 1: Comparison between the traditional education system and Outcome-Based Education

Traditional Education System	Outcome-Based Education
❖ Stakeholder participation may not be included in a curriculum that is strictly prescribed. ❖ Prioritise earning grades or marks over information, aptitude, or attitude. ❖ Disparity between a formal education and a skill set focused on a vocation. ❖ Less focus is placed on developing soft skills, such as cooperative teamwork. ❖ The alignment of objectives, actions, and assessment is not appropriate. ❖ Insufficient evaluation of competencies and efforts to enhance them further.	❖ Aimed at attaining certain learning goals for each individual learner. ❖ Major stakeholders are involved in the process of designing a more focused or cohesive curriculum that aims to develop certain talents or attributes. ❖ Results: essential knowledge and skills that students should possess or the competencies they should work on developing. ❖ Curriculum and educational systems are seen as methods, not ends. They are subject to continuous quality improvement (CQI) if they fail to complete the task.

1.3 Concept of open-book examinations: Definition and types of open-book examinations

An open-book exam was proposed in 1934 (Therriault et.al., 2011). It is an alternative evaluation system (Sikdar & Amraotkar, 2009), as it enables the students to think critically and work creatively (Theophilides & Koutselini, 2000). It can assess the problem-solving skills and reasoning skills (Theophilides et al., 1996). Such Exams eventually eliminate rote memorization and remove exam anxiety and fear, breaking emotional blocks that students encounter during examinations. (Tussing, 1951; Mahmoudzadeh, 2015). Despite having features, for effective implementation, a thorough understanding of the subject is necessary, and teachers require training. Being student-centered, assessment has the feasibility and potential for assessing transferable skills, but it also has limitations, including time consumption (Sikdar & Amraotkar, 2009) and academic dishonesty (Therriault et al., 2011).

To design student-centered education, along with classroom instruction, assessment should be student-centered. An open-book exam is a student-centered evaluation tool (Mahmoudzadeh, 2015). An open-book exam focuses on 'reasoning' rather than recalling facts, in which the student uses higher-order skills while writing the answer (Ashri & Sahoo, 2021; Tussing, 1951). The characteristic that makes open-book examinations an innovative assessment technique is that students are allowed to bring their class notes, textbooks, references and other approved materials while answering questions in exams (Kaur, 2016; Dhelawala & Saiyad, 2017). The nature of the questions in the exam is different from the conventional exam because the aim is to ignite higher-order thinking to analyses, synthesize and apply the concept (Mahmoudzadeh, 2015; Gray, 1994). This enables students to answer questions in more critical and creative ways (Tussing, 1951). Furthermore, encourage them to gain knowledge creatively and interrelate the concepts (Ashri & Sahoo, 2021).

Whereas at the implementation stage, open-book exams offer flexibility. First, it is classified primarily into two categories based on the types of materials allowed: restricted and unrestricted. In restricted open-book exams, administration allows students to bring specific, pre-approved textbooks, logarithmic tables, or dictionaries. Here, teachers conduct careful research when selecting materials because these materials should be aligned with the exam's objectives. On the other hand, in unrestricted open-book exams, administration allows students to bring any textbooks, lecture notes, or personal annotations (Dhelawala & Saiyad, 2017).

Second, it can be categorised based on its administration format. Traditional sit-down exams are conducted in controlled environments with a set time limit and specific access to reference materials. Alternatively, take-home exams are completed outside the exam hall, where students are given more time to respond, though they are expected to work independently without external assistance (Doghonadze & Demir, 2013).

Third, it can be classified based on the mode of administration into online and offline formats. Online open-book exams are conducted via digital platforms, allowing students to access materials and submit responses remotely. Offline open-book exams, on the other hand, are administered in physical settings, often in traditional exam halls or classrooms.

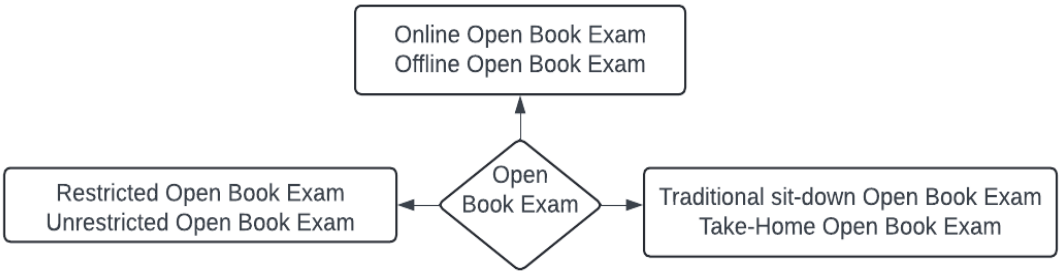

Figure 1: Types of Open-Book Exam

2. Review of Related Literature

The University of Delhi was the first central university to implement open-book exams in higher education. Banaras Hindu University, Anna University, Jamia Millia Islamia University, the National Law School, and Gauhati University have issued detailed standard operating procedures for conducting open-book exams online. Essential information was mentioned on the university's online portal, including the PDF size, exam duration, and guidelines for downloading and uploading PDFs, as well as the restrictions on handwritten submissions (black and blue pens only) and the maximum word limit. Unfair means for

which students were not evaluated: if the handwriting was not of the students, an image/PDF file of the answer sheet uploaded by more than one student was the same, plagiarism documents were not evaluated, and answers of more than one student were verbatim the same.

AICTE emphasized the use of performance indicators linked to specific competencies to enhance the quality and framework of assessments in India's engineering education system. Accordingly, the policy provided guidelines for designing Open-Book Examinations as follows:

1. Create questions that encourage students to apply and analyze information rather than simply identify or recall it.
2. Assign greater importance to the application of knowledge, critical thinking, and the effective use of resources in solving real-world, complex engineering problems.
3. Ensure students have sufficient time to complete the exam—either by limiting the number of questions to those covering two or three key concepts or by extending the duration of the examination.

It was found that students had the facility to upload answers from *anywhere and at any time*. Furthermore, students were allowed to seek answers from various internet sources in addition to the course textbooks. Meanwhile, Technical glitches (internet disconnection and digital disparity) made it difficult for students to adopt it. The teacher and student unions were also not ready to implement it. Teachers were not familiar with the open-book exams, the curriculum and teaching practices were not suitable for implementation, and they assumed it would be difficult for marginalized sections to access digital gadgets. Nevertheless, the open-book exam evaluates high-order skills; however, for effective implementation, it was necessary to transition from curriculum-driven teaching to competency-based teaching (Ashri & Sahoo, 2021).

Bansal (2022) posited that the pre-existing learning and teaching materials are not made for open-book exams. Rather, closed-book exams are more suitable, and there are disadvantages to open-book exams. Therefore, the article suggested that Law schools in England and Wales develop pedagogically informed open-book exam strategies and guidance for academic staff to review existing pedagogical practices, such as policies on marking, assessment, guidance, and instruction.

Therriault (2011) conducted a study to examine the testing behavior during open-book exams. The study employed a think-aloud methodology to collect data. Four materials engineering-based questions were developed and standardized. All the required resources were provided. Participants were then instructed to verbalize their thoughts while solving the questions. To evaluate, the rubrics were developed, and weightage was given to the number of times critical decisions were taken while solving the problems. Finally, after analysis, the session was categorized into five distinct exam behaviors, which students performed during the exam. These were:

1. Reading from the textbook
2. Writing (working on the problem)
3. Calculating
4. Reading the test question
5. Talking and reflecting

The study suggested the need to train students to improve their exam performance and educate them on effectively using resources for professional practice, such as open-book exams, to solve problems.

An open-book exam aligns closely with outcome-based education, as both emphasize results-oriented learning. A bibliometric study was conducted on outcome-based education in higher education (Tsanyia, 2025 and Mehul, 2025). The study found that countries such as India, the Philippines, and Malaysia were leading in publications on outcome-based education, revealing that global competencies can be developed

in graduate students through this approach. However, the study also highlighted that the limited amount of published work on outcome-based education poses challenges to its widespread adoption across university programs.

Professional courses, such as law, medicine, and engineering, demand certain skills in students. An open-book exam helps to evaluate students' understanding of concepts and their ability to apply knowledge. Similarly, the teaching profession emphasizes the professional development of teachers and establishes standards and expectations for them. The National Curriculum Framework (NCF) 2005 and the National Curriculum Framework for Teacher Education (NCFTE) 2009 stated that the quality and extent of learner achievement are primarily determined by teacher competency and sensitivity.

The studies reveal challenges at every stage of conducting open-book exams, including framing questions, grading, administration, technical glitches, student behavior, and the dissemination of knowledge on open-book examinations. It depends on the teacher educator's ability and belief in open-book examination to resolve these problems.

Self-efficacy, a fundamental element of Bandura's social cognitive theory, plays a crucial role in determining an individual's resilience, motivation, and professional conduct (Zumeri,1997). Teachers' self-efficacy in the classroom reflects their confidence in their ability to engage students, manage tasks, and utilise resources effectively. Self-efficacy is defined as a teacher educator's belief in their ability to confirmation of learning outcomes in outcome-based education through open-book exams in the digital era. For teacher educators, high TSOBE (Teacher Educators' Self-efficacy in Open-book Examination) signifies confidence in using open-book examinations for assessing students to ensure the achievement of learning outcomes (Myyry & Joutsenvirta, 2015). Thus, to assess the self-efficacy of teacher educators, the researcher developed an open-book examination using a three-point Likert scale for self-efficacy. Descriptions of each dimension are as follows.

Table 2: Dimensions of teacher educators' self-efficacy in open-book exams.

Sr. No.	Dimensions
1	Conducting open-book examinations
2	Selection of an assessment tool
3	Interpreting learning outcomes
4	Using ICT in open-book examinations

2.1 Research Objectives

The aim of the study was to investigate the self-efficacy of teacher educators towards the open-book examinations.

3. Methodology

As the research was conducted on a sample of teacher educators to investigate their self-efficacy regarding open-book examinations, the researcher employed an online descriptive survey method as the research design. A random sampling technique was used to draw the sample from the population of faculty members at teacher education institutions. A three-point Likert Scale was developed, and a questionnaire was created using Google Forms, which was then sent to 30 professors from various universities. However, only 16 responses were received. All respondents were teachers' educators with 10-35 years of professional experience in higher education. The scale comprises 29 items, distributed across the given dimensions of open-book exams.

4 DATA ANALYSIS AND INTERPRETATION

To find out the self-efficacy of teacher educators towards open-book examinations. The TES-OBE scale, having 29 items, was administered to a sample. The data were further categorized and analyzed concerning the overall self-efficacy and dimension-wise and item-wise self-efficacy towards open-book examinations.

4.1 Overall self-efficacy of teacher educators towards open-book examinations

To assess students' overall self-efficacy on open-book examinations, the item-wise responses of respondents have been presented and analyzed using the mean, standard deviation, and coefficient of variance. The results are shown in the following table.

Table 3: Descriptive Statistics

	N	Mean	Std. Deviation	C.V.
Mean	29	2.36	0.47	19.91
Valid N	29			

From the Table, it can be seen that the mean score for the self-efficacy of open-book examinations for teacher educators was 2.36 on a scale of three. This reflects that teacher educators have a favorable reaction toward open-book examinations. Furthermore, the standard deviation is 0.47, indicating relatively small variations, and the coefficient of variance is 19.91%, which is relatively high, suggesting that, as a group, the reaction towards open-book examinations had variations but was generally favorable.

Whereas respondents' responses were analyzed to understand teacher educators' self-efficacy towards open-book examinations, a percentage analysis was used. The maximum score obtained was 89, and the minimum was 29. The mean score obtained by the respondents was 68.73, with a standard deviation (SD) of 4.31. The total scores obtained by the teacher educators on the TES-OBE scale were classified into three categories based on the range (as per mean ± SD): Above Average, Average, and Below Average. This categorization is shown in Table 4.

Table 4: Categorisation of Score

Range of Score	Self-efficacy category
More than 73.04	Above-Average
73.04 to 64.42	Average
Less than or equal to 64.42	Below-Average

A broad-based analysis of teacher educators' self-efficacy was conducted based on the above criteria. The findings revealed that most teacher educators (80%) have an average level of self-efficacy towards open-book examinations, while only 6.7% showed above-average self-efficacy and 13.3% had below-average self-efficacy. This is illustrated in the figure by a pie chart.

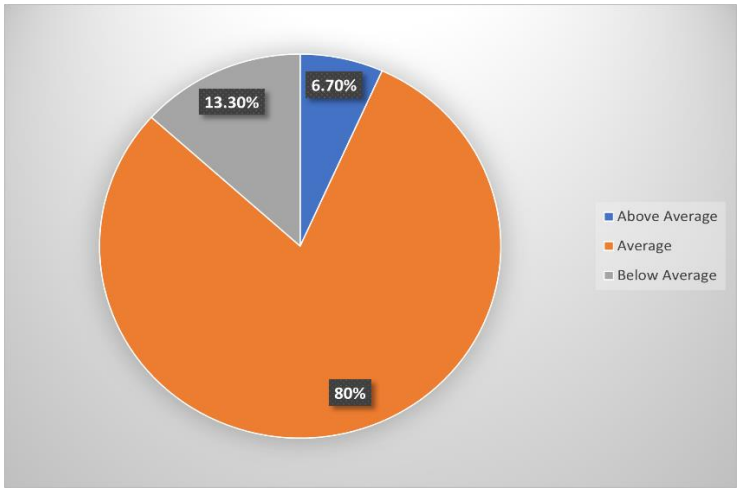

Figure 2: Percentage–wise self-efficacy of teacher educators towards open-book examinations

Based on the data shown in the figure, it can be said that the majority of teacher educators neither showed an above-average nor a below-average level of self-efficacy. They had an average level of self-efficacy with respect to their Interpreting learning outcomes, Selection of assessment tool, conducting open-book examinations, and Using ICT in open-book examinations.

To examine the relationship among the four dimensions. The correlation between teacher educators' self-efficacy in conducting open-book examinations and their selection of assessment tools, interpretation of learning outcomes, and use of ICT in open-book examinations. Pearson's correlation coefficients were computed.

Table 5: Correlations among dimensions

Pearson Correlations			
	Dimension 2	Dimension 3	Dimension 4
Dimension 1	0.335	-0.316	0.552

The results revealed a positive correlation between Self-efficacy of teacher educators in conducting open-book examinations and Self-efficacy in selecting assessment tools, with a correlation coefficient (*r)* = 0.335. as well as a stronger positive correlation was found between Self-efficacy of teacher educators in conducting open-book examinations and Self-efficacy on using ICT in open-book examinations, with r = 0.552, which was statistically significant at the 0.05 level ($p < .05$). However, a negative correlation was observed between Self-efficacy of teacher educators in conducting open-book examinations and self-efficacy on interpreting learning outcomes, with $r = –0.316$. These findings suggest that teacher educators who feel more confident in conducting open-book examinations also tend to demonstrate greater efficacy in selecting appropriate assessment tools and using ICT effectively; however, they showed a lower ability in interpreting learning outcomes within this context.

Conclusion

It can be concluded from the item's wise mean (2.36). The mean is tilted towards the highest value on a three-point scale, indicating teachers are ready to adopt and conduct an open-book exam. This shows the readiness to adopt innovative and student-centered evaluation tools that focus on problem-solving skills rather than rote memorization. These findings are supported by the studies of Therriault et al. (2011),

Mahmoudzadeh et al. (2015), and Ashri and Saho (2021), which also found that open-book examinations enhance analytical reasoning and reduce examination anxiety among learners. However, Bansal (2022) stated in his study that some teachers perceived open-book exams as less effective due to traditional curriculum design. Despite this difference, the present study advocates open-book exams as an effective assessment practice in outcome-based education contexts.

Furthermore, it was found that the majority of teacher educators (80%) showed an average level of self-efficacy. This means that most teacher educators are confident in using open-book exams; however, there remains a need for training and institutional support to further enhance their confidence levels. This trend aligns with Harlen (2019) and Murphy, Dooley, and Jones (2021), who noted that adequate training strengthens educators' self-efficacy.

The correlation analysis among the dimensions revealed a positive correlation between self-efficacy in conducting open-book exams and the selection of assessment tools ($r = 0.335$), indicating that teacher educators who are confident in conducting open-book exams are also skilled in selecting suitable assessment tools. The finding corresponds with Johnson (2021) and Boud and Falchikov (2020), who emphasized that skilled teacher educators align assessment strategies with learning outcomes.

A stronger positive correlation ($r = 0.552$) between conducting open-book examinations and using ICT in assessment indicates that teacher educators skilled in technology are also good at designing and implementing open-book exams. The finding is supported by Ahmady et al. (2023), who reported that integrating ICT tools into open-book assessments enhances transparency, flexibility, and learner engagement.

However, a negative correlation was observed between conducting open-book exams and interpreting learning outcomes ($r = -0.316$). This suggests that teacher educators who are confident in administering open-book exams may not be equally confident in interpreting the resulting learning outcomes. This implies a potential gap in understanding the connection between assessment selection and learning objectives. Similar concerns were raised by Crespo (2020) and Prasad and Aluvalu (2025), who highlighted that the effective implementation of open-book exams requires explicit alignment between curriculum goals, learning outcomes, and assessment practices. Therefore, it can be concluded that teacher educators require additional training in interpreting learning outcomes within the framework of outcome-based education.

Overall, the findings suggest that teacher educators possess a generally favorable perception of open-book exams; there is a need to strengthen their competencies in aligning assessment with learning outcomes and integrating digital tools meaningfully. The observed correlation ensures that teacher educators' confidence in using ICT and selecting assessment tools positively influences their willingness to conduct open-book exams. Thus, the findings of the present study support the broader educational reform goals outlined in NEP 2020, emphasizing competency-based learning, authentic assessment, and higher-order skill development. Strengthening teacher educators' self-efficacy in open-book exams is therefore essential for realizing these objectives.

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