

Administration of Examination Script Evaluation System with Pre-Seeded Answers using AI

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Abstract

Grading exams in colleges needs to be quick, precise, and fair - but doing it by hand tends to drag, varies from grader to grader, and suffers from tiredness or personal bias. To fix these issues, this study introduces an AI-driven tool that automatically checks handwritten answers by combining Optical Character Recognition (OCR) with smart algorithms. First, paper scripts get turned into digital format; next, OCR pulls out the written text, which the system then assesses by measuring how closely it matches reference answers - using both meaning-based comparisons and keyword overlap. Instead of just spotting identical phrases, it grasps ideas and context, leading to smarter, steadier scoring. For added clarity and justice, lecturers step in afterward to examine and approve AI-assigned grades before they're locked in. The system's rollout sped up assessments, made outcomes more consistent, yet boosted dependability, cutting down teachers' hands-on tasks by a large margin. Overall, this method using AI offers a straightforward, flexible way to grade exams by itself - giving results that feel fair and solid across any school.

Keywords: artificial intelligence (AI), digital examination system, education technology, handwritten

answer script grading, human verification (HV), optical character recognition (OCR), smart grading algorithms.

1. Introduction

Looking at exam results matters a lot in school because it shows how well students get the material, how they're improving, and how they're doing overall. Usually, teachers check and score answer papers by hand. Even though this way lets them use personal judgment, it can bring problems like uneven grading, taking too long, or mistakes from tiredness or bias. As more students join classes and piles of exams grow, marking everything by hand takes ages and raises the chance of errors.

To tackle these issues, schools are slowly bringing in tech-powered grading tools that boost speed, precision, and openness. A new method uses Artificial Intelligence (AI) paired with preset or sample answers to handle scoring automatically. It starts with Optical Character Recognition (OCR), turning handwritten replies into digital text, which smart algorithms then examine using context clues alongside relevant keywords. Instead of depending only on keyword checks like older systems, this AI-driven technique grasps meaning in sentences, making it better and more balanced when judging answers.

Older tools made by Jain and Singh (2020), along with Arora and Chauhan (2020), showed some success in grading automatically using AI plus language tech. Still, they mostly worked only on typed or brief responses - handling handwritten ones were tough, even though most school tests still use pen-on-paper answers. On top of that, no built-in text scanning ability nor simple-to-use design made those tools hard to use in actual classrooms. So now, there's increasing demand for a stronger system that scales well, reads messy writing fast, and keeps grading honest and clear.

The new AI-powered grading tool closes the gap by using OCR along with smart algorithms to automate scoring smoothly. Instead of manual checks, it reads handwritten papers, turns them into digital text, then matches answers with stored model responses for evaluation. Rather than relying only on exact words, it checks both keywords and overall meaning so real understanding is measured accurately. On top of that, a Human Check (HC) feature lets teachers go over, tweak, or approve grades made by AI - keeping the process solid and trustworthy.

This study aims to (i) make grading handwritten exams faster using automated tools; (ii) cut down on manual work and time without losing accuracy; (iii) back up results with teacher review so grading stays fair; plus (iv) build a strong, safe system that schools can use widely. With AI working together with OCR and real people checking key parts, this setup offers a practical way to handle today's grading problems effectively.

Abbreviations:

AI – Artificial Intelligence; OCR – Optical Character Recognition; HV – Human Verification; NLP – Natural

Language Processing; HC – Human Check; DB – Database

2. Materials and Methods

A new tool using artificial intelligence helps grade handwritten exam papers automatically. It moves step by step through five phases - first turning paper into digital form, then cleaning up the images before converting handwriting into text using OCR tech, followed by smart software judging the answers, ending with a teacher checking results to confirm accuracy.

Every step plays a key role in keeping things running smoothly, hitting the mark, yet staying balanced.

A. Document Digitization

The first move is turning paper answer sheets into digital files. Done by snapping sharp images or using high-res scanners. Crisp conversion matters - keeps text clear and stops mistakes when processing info down the line.

B. Preprocessing of Image

After scanning, pictures get tweaked - noise is stripped out, colours shift to grayscale, or brightness jumps up. This way, fine points pop more while imperfections - streaks, folds, or uneven lighting - fade away. With these changes in place, OCR runs smoother and grabs words way more accurately.

C. Optical Character Recognition (OCR)

This step pushes the tidied images into an OCR system which grabs handwritten text instead. Instead of just reading letters, the software detects shapes and strokes typical of human writing. Even when handwriting slants oddly or letters vary in size, the tool adjusts on its own.

That way, what it pulls out stays true to what was actually written. This part makes it possible to check answers by machine later on.

D. AI-Based Evaluation

After pulling out the text, the system checks every student reply against ready-made answer templates using a pair of methods that work together: one builds on the other. Determines if the student's answer matches the model one in meaning, though words might differ - using comparison of ideas instead of exact terms.

Keyword Matching: Looks at key terms, hitting core ideas - verifies facts for correctness.

The mix of these two methods keeps things steady between grasping ideas and getting facts right - so the AI gives a rough score along with how sure it is.

E. Human Verification (HV)

Even if machines give fast, neutral feedback, people still need to check things to keep grading fair and make sense of tricky details. During manual checking, teachers look over computer-assigned scores, match them against actual student writing, then tweak results when needed. This mix helps reach balanced outcomes - one part speed from tech, one part judgment from experience.

Fig. 1 ER diagram

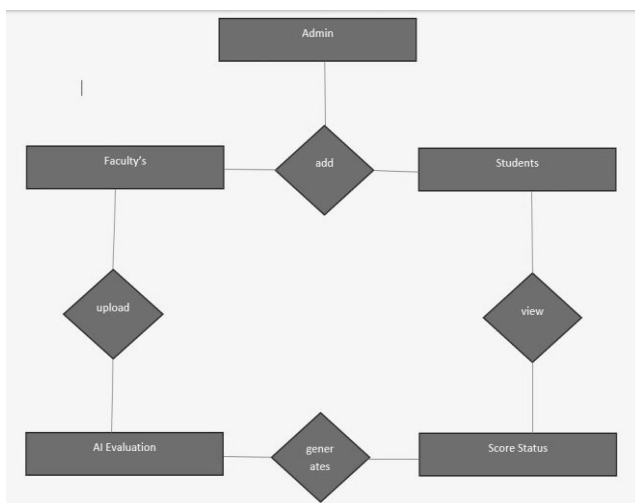
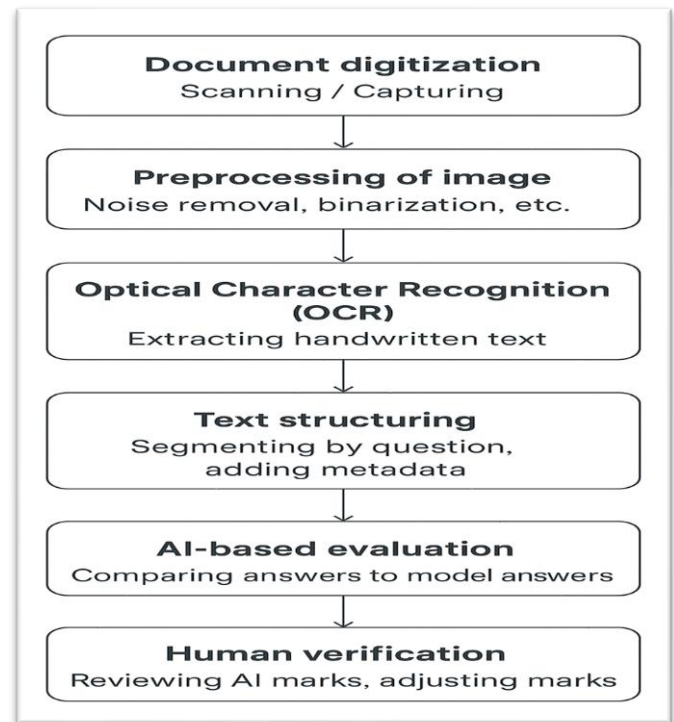


Fig. 2 shows how the AI-supported test script review setup works step by step



3. Results and Discussions

The implemented system shows clear improvements in both performance and reliability of grading. Testing results demonstrate that automation drastically reduces evaluation time, helping teachers publish results sooner while minimizing manual workload.

The hybrid scoring mechanism, which merges semantic similarity and keyword-based checks, provides better grading consistency and fairness across all evaluated scripts. This two-part method reduces personal bias while keeping ideas and facts equally strong.

Adding Human Verification means results feel more trustworthy, since each script gets checked by a person at the end. Thanks to this extra layer, automated mistakes

happen less often, making decisions more balanced overall. Since it runs online, different people can use it at the same time, with all info stored in one main spot. With this setup, it can grow easily and fit right into larger organizations.

The whole thing works better when OCR hooks up with AI and web tools, making college exams easier to check, clearer to follow, not prone to errors.

4. Conclusion

This research shows how an AI-powered exam grading tool could make marking student papers faster and easier in schools. It uses OCR tech to read handwritten answers, while artificial intelligence checks each response for meaning and depth. By combining these two methods, the system tackles common issues in hand-marking - like how long it takes, tired markers, uneven scores, and personal bias.

Automating grading cuts down busywork for teachers, so they can spend time boosting learning and connecting with students instead of getting stuck in routine paperwork. Thanks to AI-driven meaning checks, student responses aren't just scored for keyword matches - ideas and context matter just as much. Because of this, results become more reliable and balanced, especially on open-ended questions where different people might otherwise grade differently.

A Human Verification step adds extra strength by keeping things fair and clear, even when automations involved. Mixing smart tech with real human judgment helps teachers and learners feel more confident, while also holding the system responsible for its choices. Thanks to this setup, decisions stay transparent and can be tweaked

when needed - ideal for use across big schools or universities.

Down the road, this setup might get even better with a few tweaks. Coming updates may add OCR that handles various languages, smarter models learning from teacher input to boost precision gradually - also linking up with school databases or platforms like LMS so grading flows without hiccups.

In short, this AI-based grading system offers a flexible, clear, plus smart fix for old-school test scoring problems. Not just faster or more efficient, it also boosts fairness, consistency, along with fresh approaches in how students are assessed - pushing education further into the digital age.

Conflicts of Interest

There's no personal stake involved in putting out this study.

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