Visualizing Formative Feedback from Computer-Based Assessments

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Introduction

For universities and colleges, providing high-quality formative feedback has become an indispensable part of an effective teaching and learning environment. The primary goal of assessments with formative feedback is to provide ongoing information that can be used by instructors to improve their teaching and by students to improve their learning. Increased numbers of students and the corresponding increase in time spent by academic staff on feedback has garnered interest into how computer-based testing can be used for improving the quality of formative feedback.

This project aims to create a score reporting system called **ExamVis**, which is integrated with a computer-based assessment system. **ExamVis** delivers immediate and customized feedback to students via interactive data visualizations. In this study, computer-based assessments will be administered at the Learning Assessment Centre (LAC), which is a large computer-based testing facility at the University of Alberta.
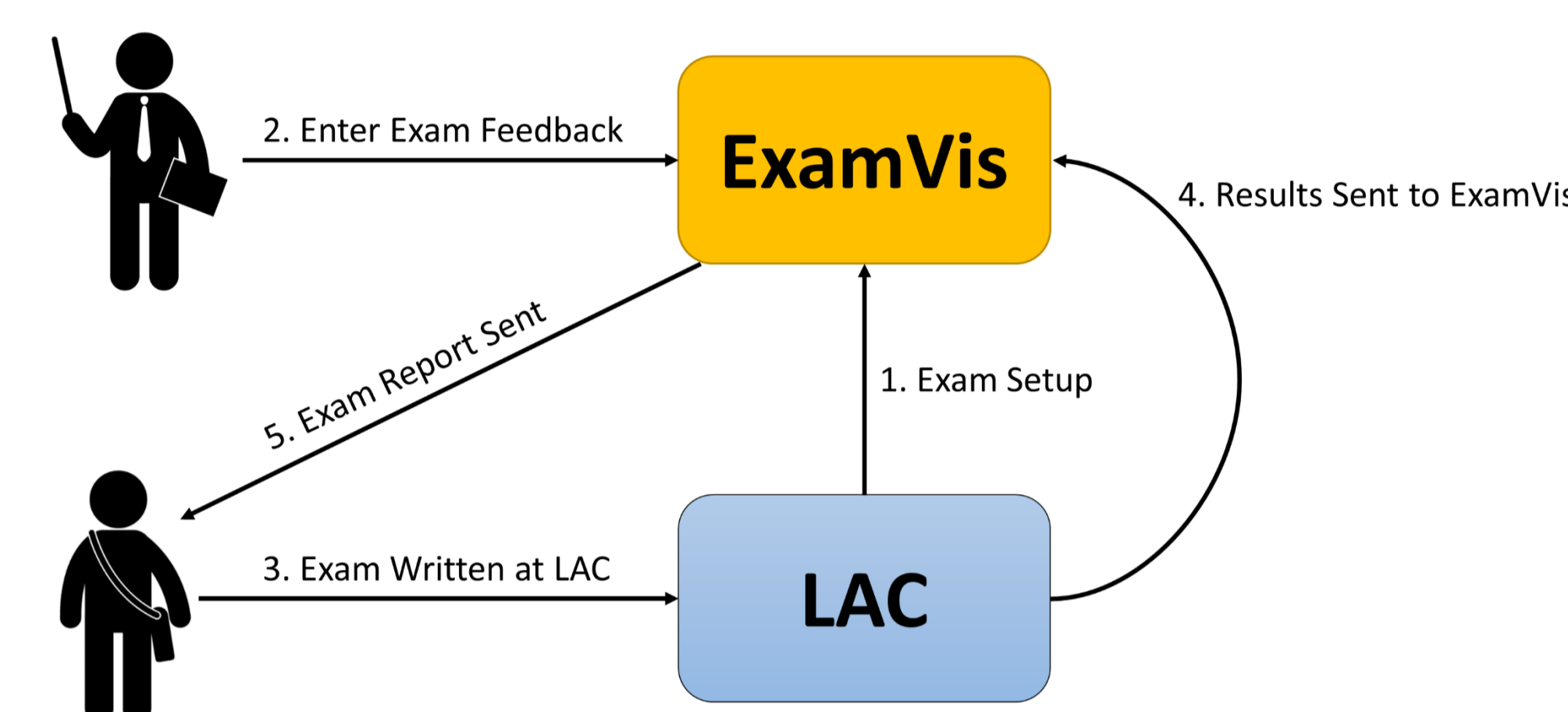
Research Questions

The following research questions guide this study:

1. Can visualized formative feedback from computer-based assessments improve student learning?
2. How does involving in effective formative assessment practices affect students' attitude toward feedback?
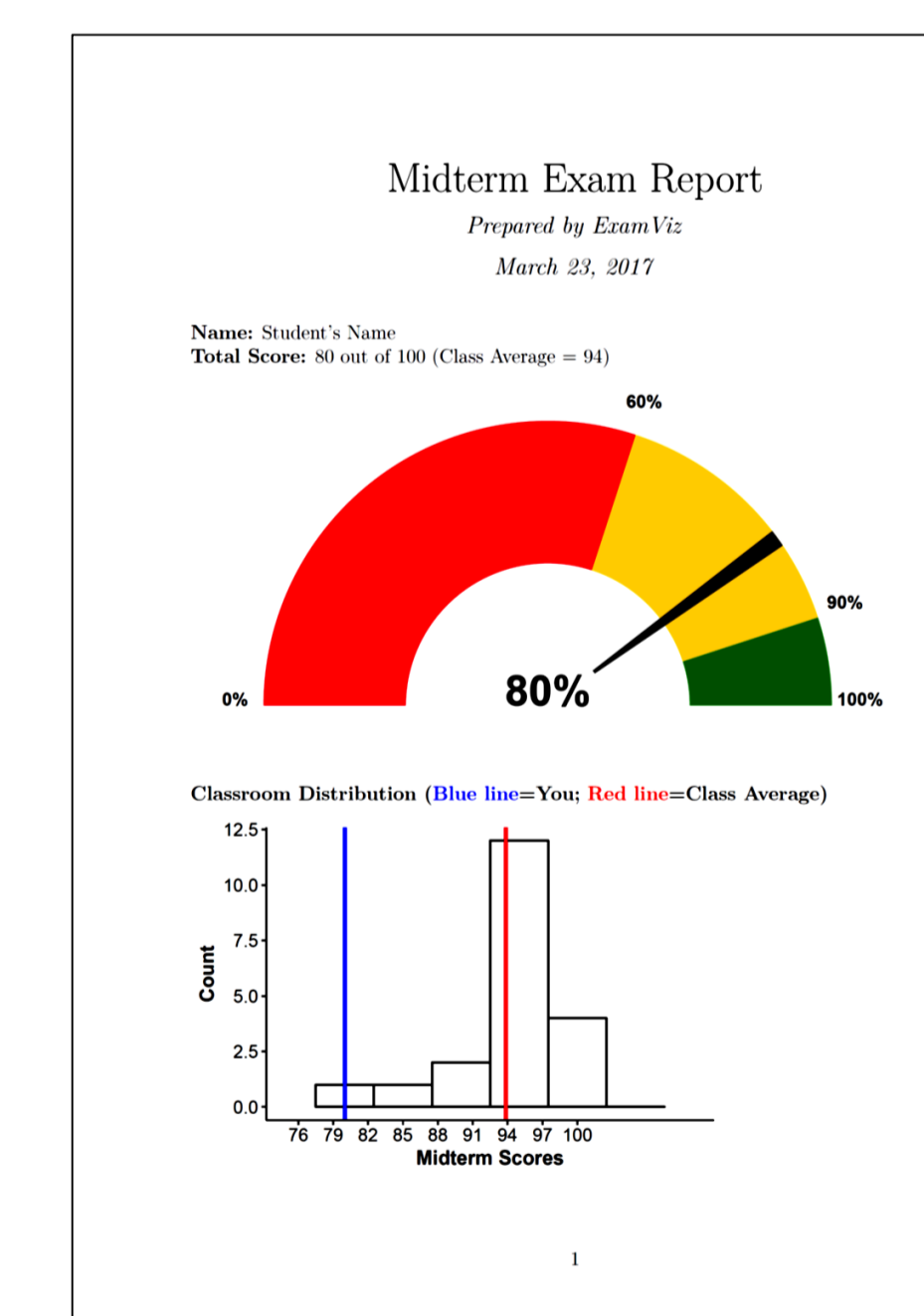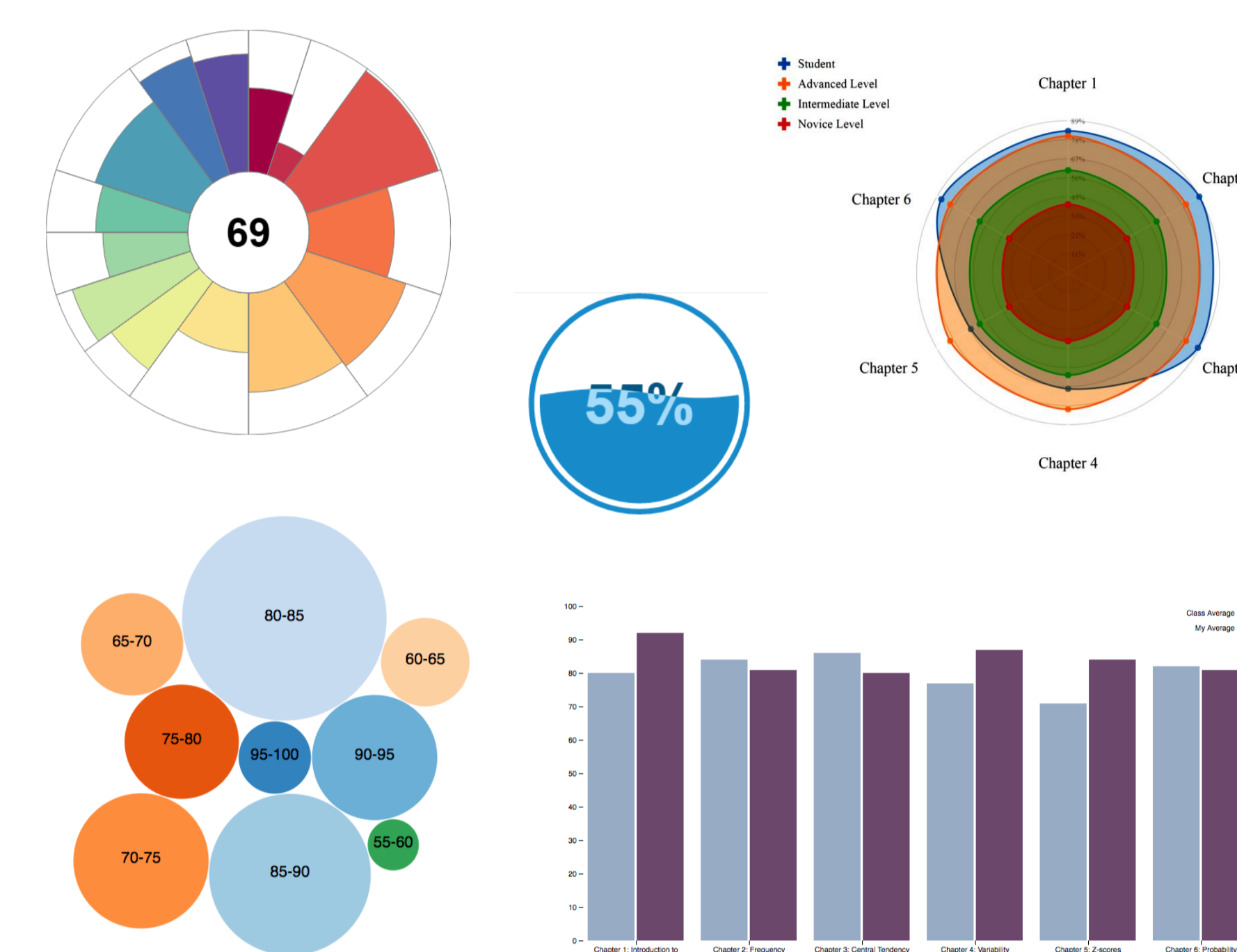
Method

An Overview of Workflow in ExamVis

Some Visualizations in ExamVis

How ExamVis Works

1. The instructor creates a multiple-choice exam and sends it to LAC along with predefined feedback statements based on lectures, chapters, or content areas.
2. Test items on the exam and feedback statements are digitized at LAC.
3. After students write their exam at LAC, **ExamVis** automatically generates an exam report for each student and presents written and visual feedback together.
4. After the exam period is over, a more detailed report is available to students from the **ExamVis** website.

Student will identify:
- **areas of strengths, and**
- **areas that need further study**

Significance

This study has three important implications. First, **ExamVis** will help instructors reduce the time spent on marking, while providing individualized and objective formative feedback to students in a timely manner. Second, **ExamVis** will engage students in the interpretation of their exam results for the purpose of better understanding their strengths and weaknesses. This will result in improved learning outcomes and lead to a more positive attitude towards formative feedback. Third, the findings of this study will help other universities and colleges design and implement interactive score reporting systems. To accomplish this goal, we will share our findings at workshops, presentations, and publications.

Next Step

During Fall 2017 and Winter 2018, **ExamVis** will be implemented in two undergraduate courses in the Faculty of Education at the University of Alberta. Both courses have multiple sections with 100 or more students. Students who write their midterm and final exams at LAC will receive immediate and customized feedback about their exam performances. In addition, students will have access to a detailed exam report after the examination period is complete. This report will enable them to see their performance relative to their classmates. We will evaluate **ExamVis** based on growth in student achievement.