Engaging Students Through Technology: A Team-based Collaborative Approach to Transforming Student Learning in a Risk Management Module

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Outline

- Problem definition
  - Data-based decision making in finance industry
  - Career readiness of graduates
  - Addressing the problem: Pursuing a teaching and learning environment imitating the workplace
- Innovations to address the problem
  - A computational environment
  - Real-world financial data
  - A competency-based (computer-based) assessment
    - Conceptual understanding (Conceptual knowledge)
    - Integrating theory and practice (Procedural Knowledge)
  - A research-led group project

Problem

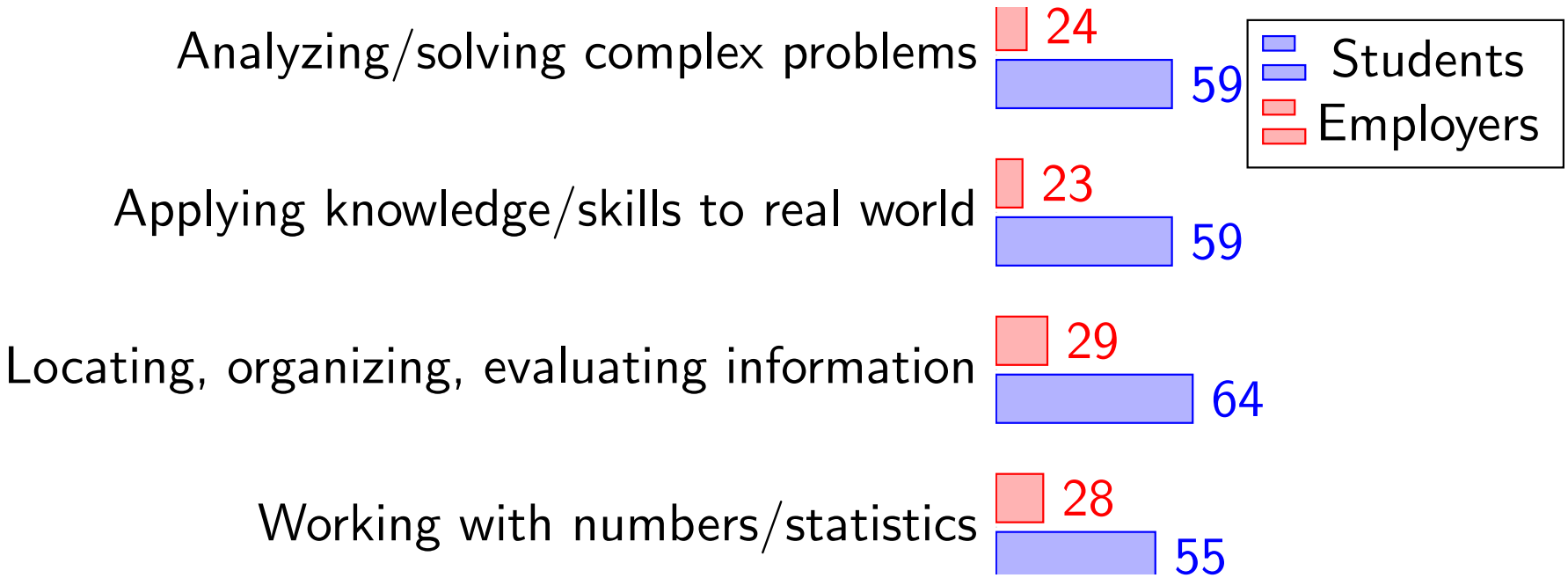
- The finance industry's reliance on public and private data
  - Increasing amounts of data to be processed and analysed
  - Quantitative skills in greater demand
- Training in Finance programmes slow to react to changes in the industry
- The most important obstacle: Resistance from academics
  - Change the way they engage with students
  - Change the way they assess student performance
  - Both requiring time investment and willingness to take measured risks

Career readiness of graduates

Career readiness of graduates has been questioned by The Association of American Colleges and Universities (Jaschik, 2015)

- Similar questions are asked to students and employers

Proportions saying recent graduates are well prepared in each area



Students' perception on the competency of recent graduates is not reflecting the reality

Addressing the problem

- Developing authentic learning environments
  - Resembling working places
    - Generic skills
    - Collaboration skills
    - Communication skills
    - Technological skills
  - All these skills are interconnected and should be integrated in the module design

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1. Computational environment

- A computational environment have been introduced
  - All the lectures and tutorials held in a computer lab
  - I taught `R`, a statistical and programming software, to the students
    - No assumptions made on previous programming experience
    - The theories and methodologies implemented in `R`
  - All the module materials (lectures, tutorials) redesigned by me to accommodate this change

2. Real-world financial data

- Real-world financial data used to showcase the methodologies of risk management **instead of short text-book examples**
  - The students are instructed how to download data from Yahoo Finance using `R`
  - They learned and practiced how to analyze data in `R`
  - The students found their own data for their group projects

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3. A competency-based (computer-based) assessment

- A competency-based (computer-based) assessment which requires **no memorization** was used for the final exam.

  The exam has two parts;

  Part A: Risk management related concepts (34 Points)

  - No material (lecture notes or books) is allowed
  - Assesses students' comprehension of risk management related concepts
    - Conceptual knowledge assessment: Students asked to provide definitions or explanations (Rittle-Johnson and Schneider, 2015)
  - Can be answered intuitively
  - The exam imitates the reasoning skills needed for daily operations in a risk management-related work place

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3. A competency-based (computer-based) assessment

Part B: Computer-based exam on know-how on risk management solutions (66 Points)

- Everything (lecture notes, books, and lab desktop computers) is allowed (with no internet connection)
- Assesses students' knowledge and know-how on risk management solutions
  - A procedure defined as a series of steps, or actions, done to accomplish a goal (Canobi, 2009)
  - Procedural knowledge assessment: Generally, students asked to solve problems (Rittle-Johnson and Schneider, 2015)
- Some of the questions use real-world data provided in CSV (comma separated values) format
  - Requires programming skills in `R`

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4. A research-led group project

- My technology-enhanced learning and teaching environment allowed me to cover state-of-the-art risk models and their quantification
- A research-led teaching approach requiring the students to replicate numerical results of academic papers implemented
  - Requiring an understanding of state-of-the-art cutting-edge practice in risk management
  - Not only combined all the components of the module (real-world financial data, programming in `R` and research on risk management) but also catalyzed the learning process of students

Additional measures

The following additional measures needed to be taken to make the students engage more effectively with the materials:

- Biweekly meetings with all groups to track their progress related to the group project
- Monitoring student attendance
- Posting assignment questions and their solutions on ICE (Moodle) weekly to support student learning

Conclusions

Advantages:

- Improved student engagement and performance
  - MQs and module marks are inline with this conclusion
- Major benefits for students, employers and even for lecturers

Disadvantages:

- Never complete and requires constant improvement and adaptations
- Requires expertise in a computational environment

References I

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