

Development of an innovative teaching toolbox for pharmacokinetics

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Pharmacokinetics

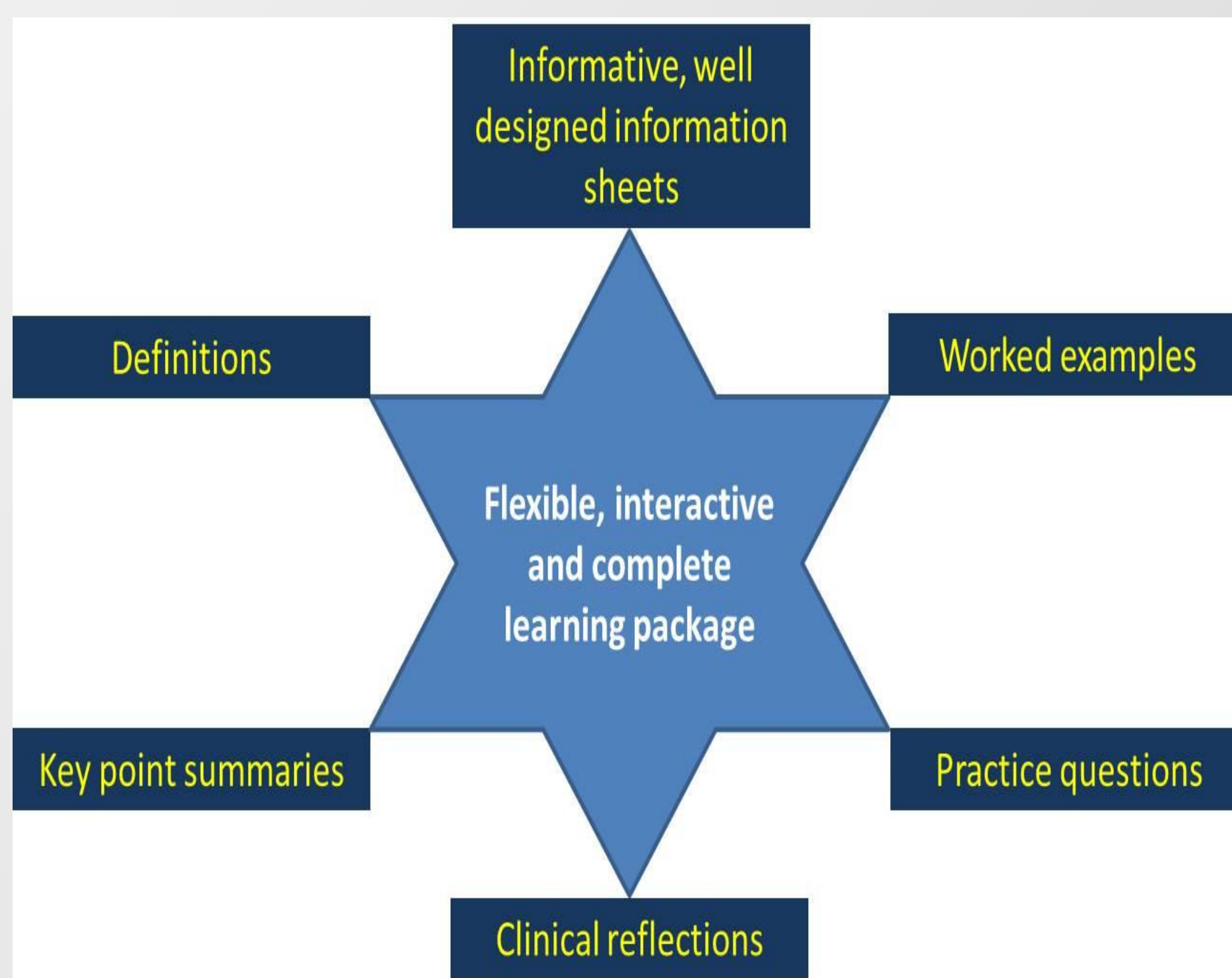
- In pharmacology (clinical and basic), pharmacokinetics (PKs) is a key aspect of the curriculum in terms of drug development, design and administration.
- The traditional didactic approach is dull making it challenging for both learners and educators.
- UG/PGT feedback shows new approaches are required to develop and enhance student engagement with this *threshold concept*.

Aim

- Creation of interactive and innovative approaches to invigorate the way pharmacokinetics are taught.
- A "students as partners" approach ensured applicability and relevance to the student experience/perception of the subject area.
- 4 projects undertaken funded by 2 BPS teaching grants and Institutional Learning and Teaching Enhancement Project money.

Project 1: Online learning hub

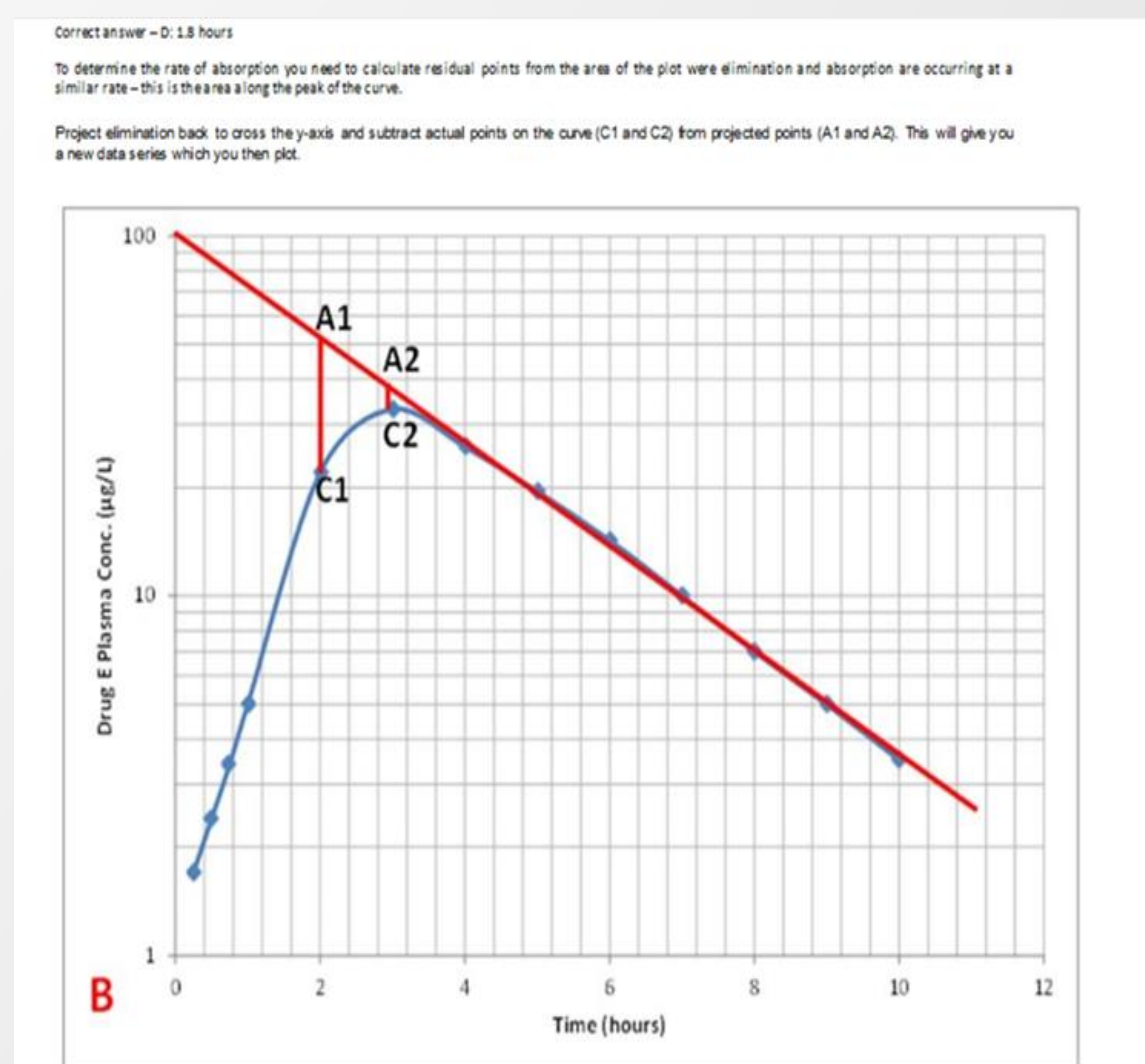
- Simple design involving a hierarchy of interlinking spreadsheets available through the virtual learning platform (Blackboard).
- Created a flexible and adaptable resource written *for students, by students*.
- By interlinking a variety of spreadsheet types an innovative and effective learning package was delivered:



Project 2: Experiential PK learning

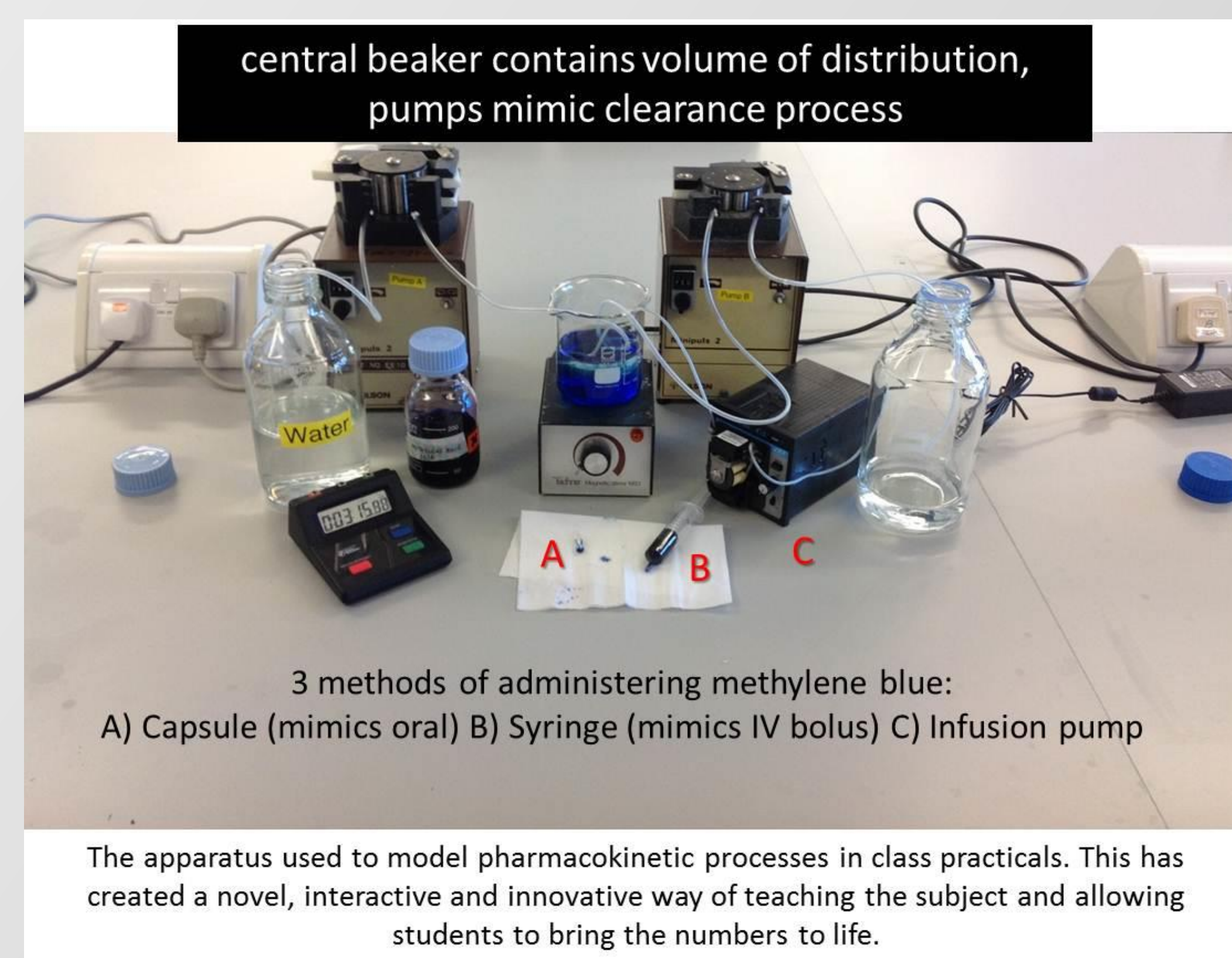
- A feedback driven learning circuit was created using assessment software to lead students through the process of handling PK data.

- Forges links between raw data and actual clinical/pharmacological meaning in a step-by-step manner:



Project 3: A PK practical suite

- A series of practical exercises were designed and implemented utilising a simple experimental model system:



- By modelling the elimination of a drug (methylene blue) from the system, students can visualise PK processes.
- The system can generate data pertaining to single and multiple IV, oral and infusion based administration.

Project 4: Online PK simulations

- Adaptation of practical exercises outlined in project 3 to online feedback driven exercises.
- Utilises feedback loops to guide users through the set-up and operation of the model system, with subsequent data production and analysis.
- Provides added flexibility and accessibility for this unique practical PK teaching approach.

Evaluation

- Statistical tracking proves that online resources (project 1 & 2) are being used:
 - 700 hits by UG cohort (50 students)
 - 400 hits by PGT cohort (30 students)
- Feedback on project 3:

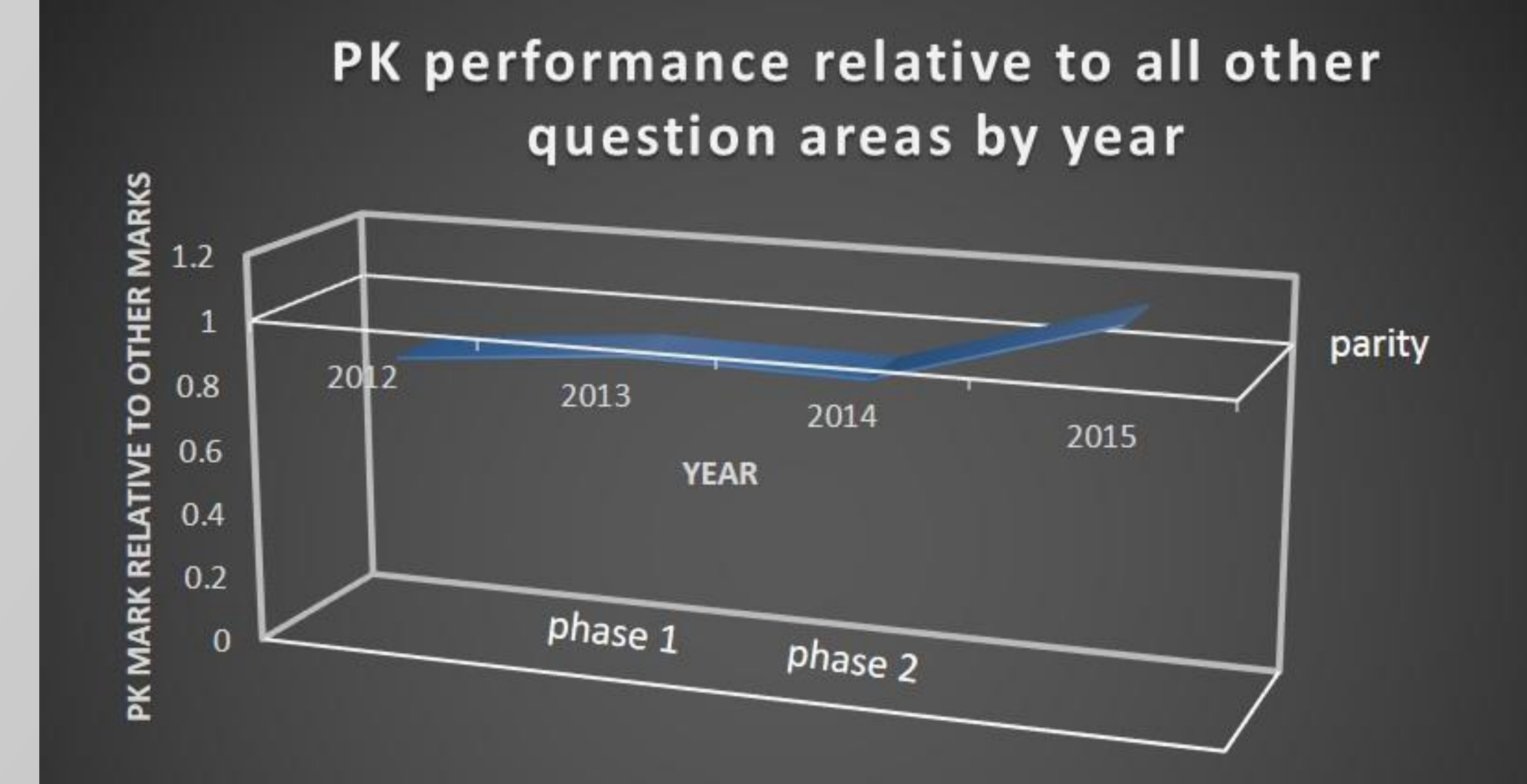
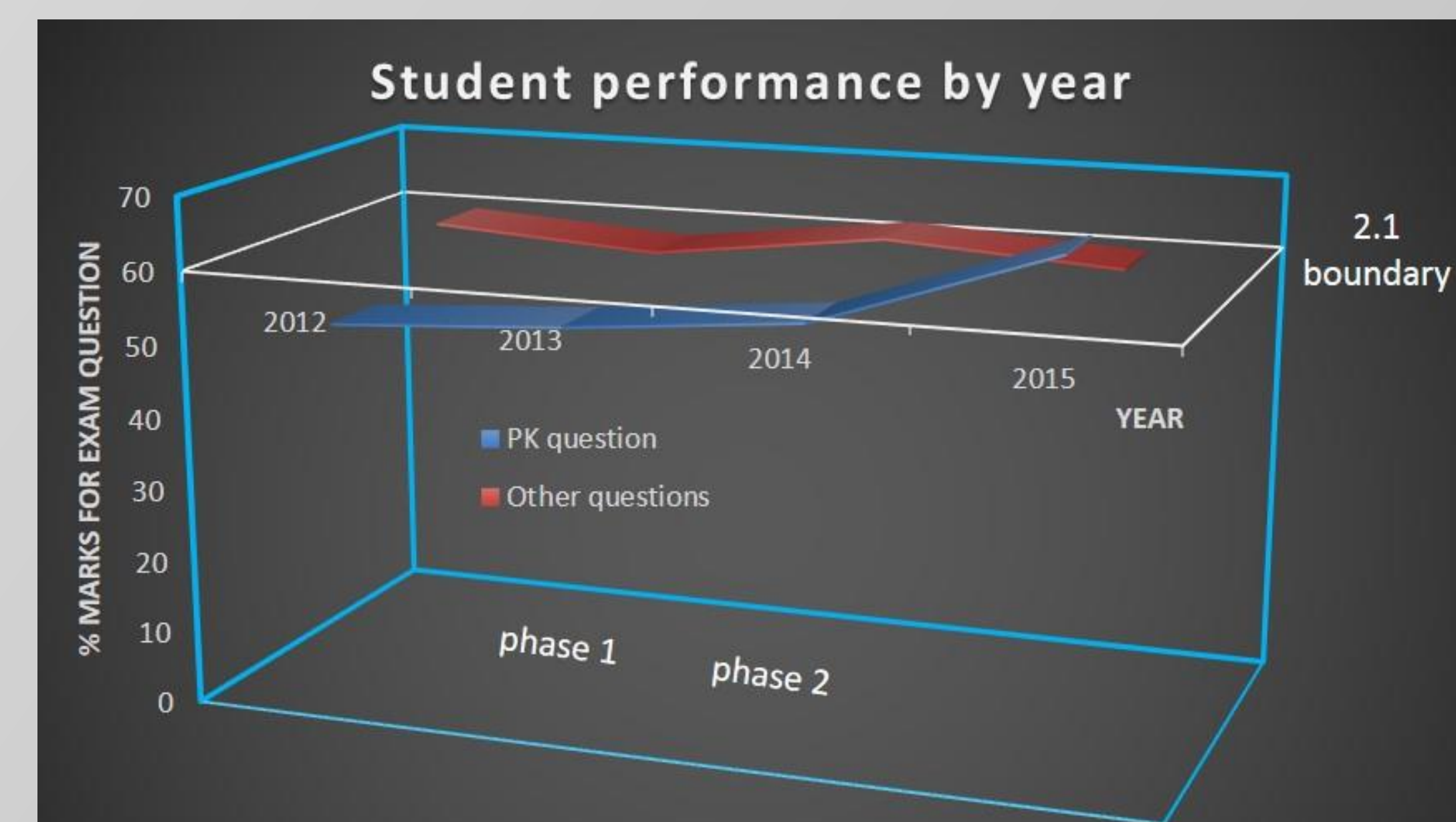
"Really useful for understanding concepts"

"clear and useful"

"I better understood the concepts when I was doing the lab work and writing up the report"

"they helped in understanding the theoretical part of the course"

- Impact on grades in level 3 UG PK assessments after 2 phase introduction (practicals 2012/online resources 2014):



Conclusion

- This holistic approach has invigorated a traditionally difficult curricular area and enhanced student experience/performance.
- Designs applicable across disciplines.
- We would like to acknowledge our student partners: Shelby Barnett (project 1) and Alex Currie (project 2).