Playing to the Strengths of non-Major Students in Astro 101

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Background & Struggle
Astro 101 is a generic label for introductory survey courses for non-majors in University.

A common struggle for instructors of Astro 101 is working with, or around, the students’ deficiencies in science and mathematical preparation.

Astro 101 can be taught as a watered down (astro)physics course but can lead to frustration of both instructor & students. • Instructor sees student deficiencies • student sees focus on math & physics

This poster describes an implementation of Astro 101 where the paradigm has been turned around to work with the strengths of the non-major students, rather than focusing on their deficiencies.

The term paper is illustrated in detail.

Student Strengths
Kwantlen Polytechnic University (KPU) is an undergraduate University outside Vancouver, Canada • All classes are limited to 35 students • The typical Astro 101 student at KPU is an arts or business major • Astro 101 carries a 1st year number, but • students can be in years 1, 2, 3 or 4 of a 4 year degree

When students enter the Astro 101 class, they typically bring with them skills and experiences exceeding those of typical science undergraduates, in areas such as • paper writing • active group learning • public speaking • group presentations

Business students are particularly skilled at group presentations

Term Paper
During a 13-week semester, each student develops a topic and writes a paper. There are five main components to the process.

Part 0 – Plagiarism Awareness Tutorial (due Week 5)
The University offers an online tutorial on citation and what constitutes plagiarism.

Students:
• Take the tutorial and earn a digital “badge”
• Many have already done it
• Required before submitting a proposal

Part 1 – Proposal (due Week 5)
Each student submits a proposal • “Free” choice of topic • Encourages early start on paper • Must include at least one reference (i.e. students must first find literature) • Requires instructor approval • Often requires revision/resubmission

A common reason for non-approval is a topic that is too broad & shallow.

Small class size means the instructor can work with each student on developing a reasonable proposal.
• Personalized topic reduces “copy & paste”

Part 2 – Paper (main body) (due Week 10)
Papers are:
• 6~8 pages
• Requires 3+ sources

Part 3 – Abstract Booklet
Abstracts are:
• Submitted online (due Week 10)
• Compiled into a booklet
• Distributed to all students (Week 11)

Homework Assignment #12: (due Week 12)
Abstracts are split into two groups. For the first group:
• Read each abstract and
• Prepare at least one question to each author (to be used during panel discussion)

Homework Assignment #13: (due Week 13)
• Do same for second group

Part 4 – Panel Discussion (Weeks 12 & 13)
Students are called up in groups of ~4

Each panel:
• Ideally assembled from related topics
• Fields questions from the class or each other
• Lively debate is common

Panel discussion provides a forum for students to share their new knowledge with the class, transforming what might have been a solitary exercise of paper writing into a culminating community experience.

Course Components
Group Presentations & Peer Feedback 20% Collaborative Group Assignments 20% Online Homework prior to class 10% Labs (weekly) 25% No Exams 0% Term Paper (this poster) 25%

Total 100%

Discussion
The course described here is very different from the traditional science course.

Astro 101 is perhaps the student’s last science course:
• No requirement to prepare student for the next astronomy course with specific content
• This freedom helps make departure from traditional practice possible

Plagiarism – unintended improvement
• A widespread concern at Universities
• Reduced incidences of plagiarism on papers
• Possible reasons
  • Instructor works with student on topic
  • Topics are less generic
  • Student has to appear on panel
  • must actually know the topic

This format is made possible with small classes.

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