DISCUSSANT SUMMARY: TOPIC 6 – COLLABORATION WITH OTHER DISCIPLINES TO ENHANCE STUDENTS' STATISTICAL THINKING

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PRESENTERS

	Title	Presenter/Co-Author(s)
Short paper	*Mixture DOE on Video Game Physics*	Mason Chen (USA)
Short paper	*Pre-Service Teachers' Experiences of Integrating Statistical Investigations in their Curriculum Areas*	Sashi Sharma (New Zealand)
Short paper	*The project method as a motivator in non-statistical careers*	Teresita Terán (Argentina)

PRELIMINARY RESEARCH QUESTIONS

- What can statistics and statistics education learn from other disciplines?
- What can other disciplines (e.g. computer science, computer science education, domain application areas, etc.) contribute to statistics education?
- What are the emerging educational approaches for engaging students at different ages in multidisciplinarity of statistics and data science?
- What are the opportunities and challenges in integrating data science in existing school curriculum including mathematics and statistics, science, computing and other data-rich subjects?

KEY DISCUSSION THEMES

Mason Chen's paper described a video game approach, designed to enable students to make connections between physics and statistics.

Sashi Sharma's paper described how pre-service teachers of physical education, social sciences and English taught two sessions incorporating statistical investigations in their classrooms with 11 to 13-year-old students.

Teresita Terán's paper described an exploratory study where undergraduate veterinary students completed a project as part of their final assessment.

Across the three papers, the following themes emerged:

- The challenge of posing good statistical investigative questions
- Student motivation – enhanced when there is purpose to their investigation
- Making connections between statistics and other disciplines
- Providing experiences in collecting data and working with secondary data

In addition to the themes above, session discussion provoked additional ideas, issues, and challenges such as:

- How to group students for project work, particularly in diverse classrooms
- Workload implications for instructors supervising student projects
- Finding time to build solid foundations in an already-packed curriculum
- How does the PPDAC cycle relate to the scientific method?
- Scientific inference versus statistical inference

Participants shared their experiences when working with groups, particularly in terms of assigning students to groups. Peter Liljedahl's (Simon Fraser University) work, involving researching student-groupings in mathematics classrooms, was suggested as a useful source.

Many session participants agreed that project students can absorb a lot of time. The main area where time is invested is in defining the problem, or more specifically, constructing the statistical investigative question that needs to be answered. This was certainly the situation for Teresita, who acknowledged that once the 'problem' had been defined, students could generally progress well. Having students enact the whole statistical enquiry cycle can often be too much when time is short. This observation tied in with Sashi's pre-service teachers who had two lessons with their students.

Some key ideas that emerged in the discussion:

- When students 'do statistics' in their science classroom, for example, do they recognize that they are doing statistics? Or do they see it as a scientific endeavour?
- We don't want our students to lose sight of statistics. We need to promote the statistical enquiry cycle and make connections across disciplines.
- Posing good statistical investigative questions is crucial. Students may need many more experiences of this to plan and execute the statistical enquiry cycle successfully.