A Study of Instant Hands-on Experiences in Introductory Statistics Class for Undergraduate Students

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Electronic Conference On Teaching Statistics
May 14, 2012

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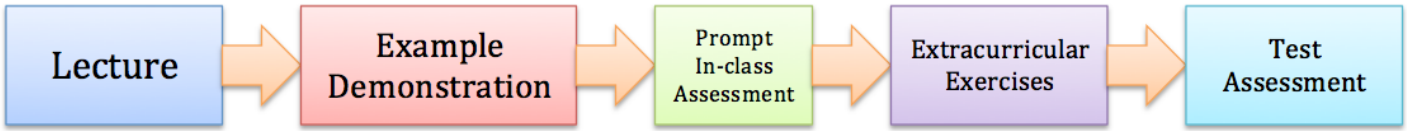

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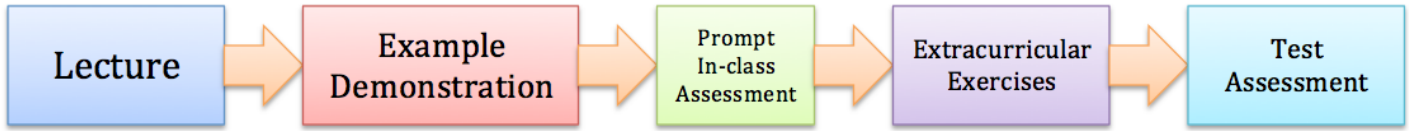

- Proposed structure by introducing the **Instant Hands-on Experiences**

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4. Recommend the implementation guidelines to resolve the confliction with intensive lecture time.

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Demographical comparison shows the similarity between the two groups.

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3. Teaching Evaluation
   We focus on two questions: "level of interest" and "difficulty of materials".

Analysis Results

1. Confidence comparison before/after in-class activity

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We tested the significance of the confidence increase by the signed-rank test:

p-value	Topic
< 0.01	16 Hypotheses testing for p 6 Normal probability calculation 10 Tree diagram 14 Confidence interval for p 11 Random variable
$0.01 \sim 0.05$	9 Disjoint vs. Independent 18 Correlation 4 Boxplot
$0.05 \sim 0.1$	7 Probability rules 12 Sampling distribution for p 15 Confidence interval for mean

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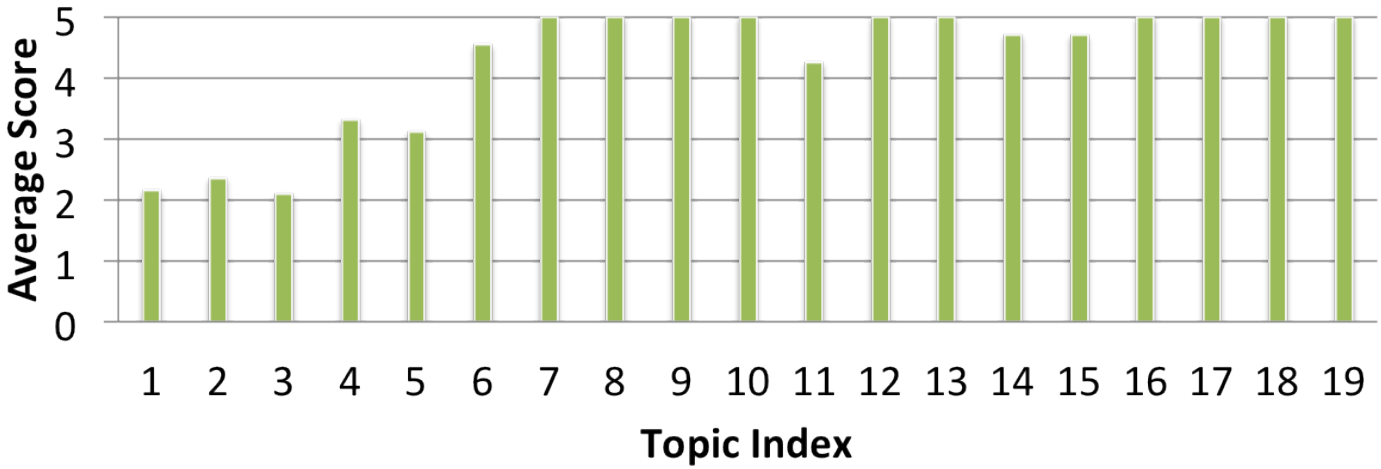

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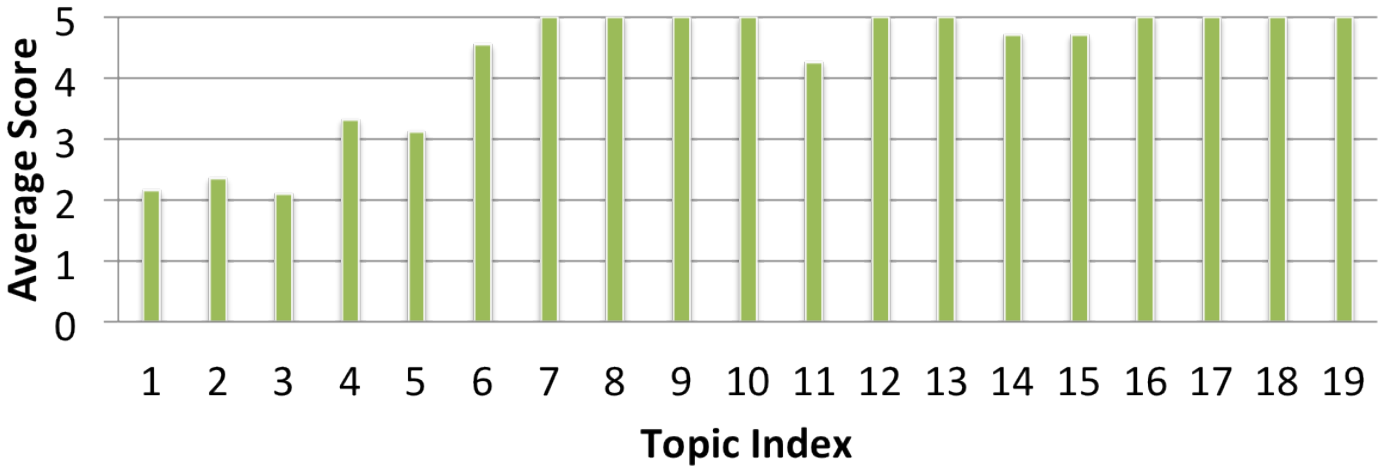

- From the start of Part II (probability), the students' feedbacks remain close to "strongly need it".

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p-value	Topic
< 0.01	All the topics in Part III: Statistical Inference 10 Tree diagram
$0.01 \sim 0.05$	19 Linear regression 9 Normal probability calculation
$0.05 \sim 0.1$	4 Boxplot 8 Venn diagram 9 Disjoint vs. Independent

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4 Overall test performance comparison (Full score is rescaled to 100.)

Term	Mean	SD	95% C.I.
2010	73.15	17.3	(66.62, 79.68)
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- Level of Interest (1-very high; 5- very low)
  Mean: Summer 2010=3.1; Summer 2011=2.59
  p-value= 0.4595 indicates an insignificant change.

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Here are some implementation suggestions:

- Use the activities for all the topics in statistical inference, tree diagram and such topics which have a complicated operation process.
- Follow closely with the example demonstration.
- Join the students' to work on the activies all the time.
- Disassemble the large activity into small parts.