



Badminton Content Knowledge Study

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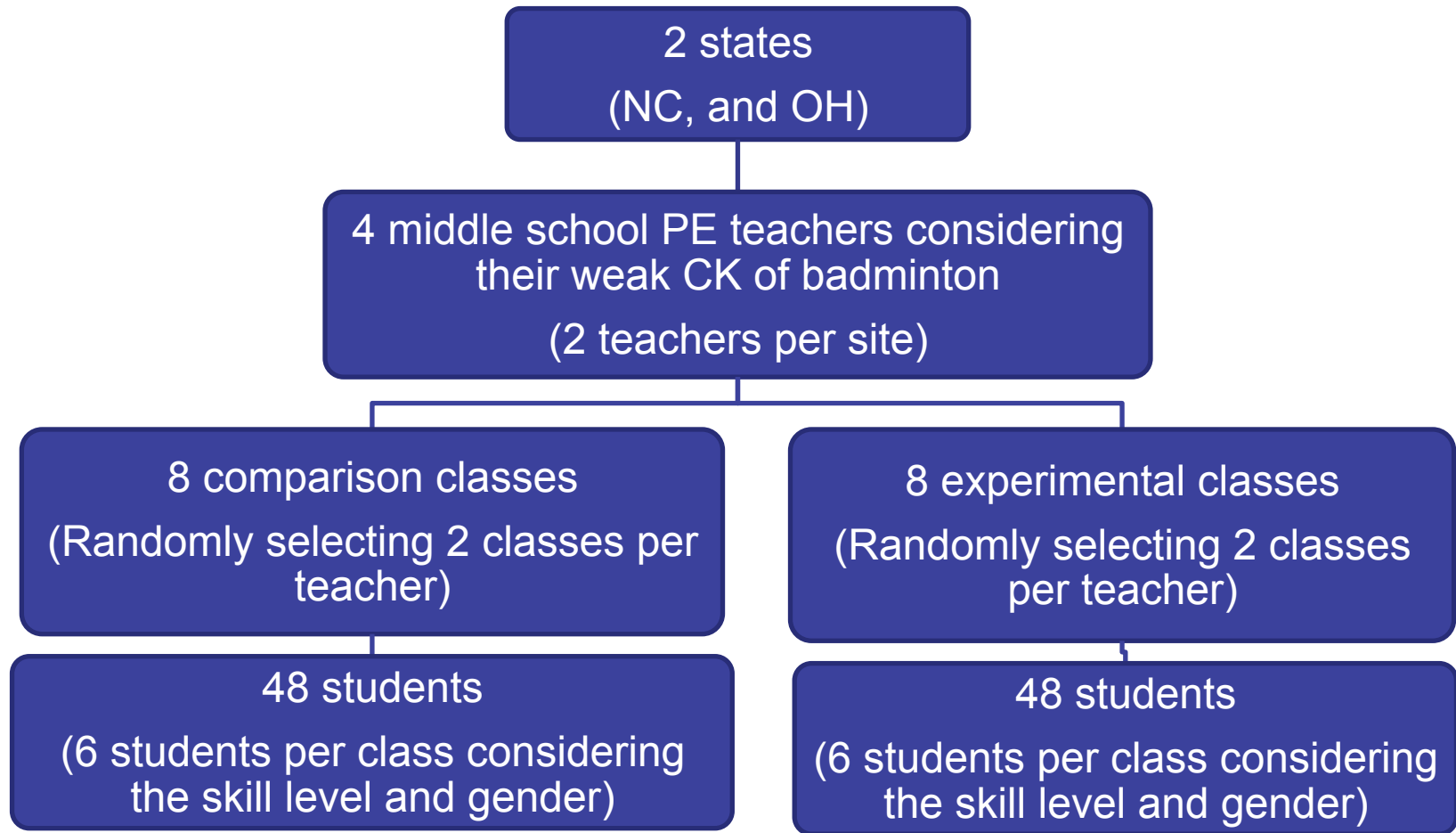


Purposes

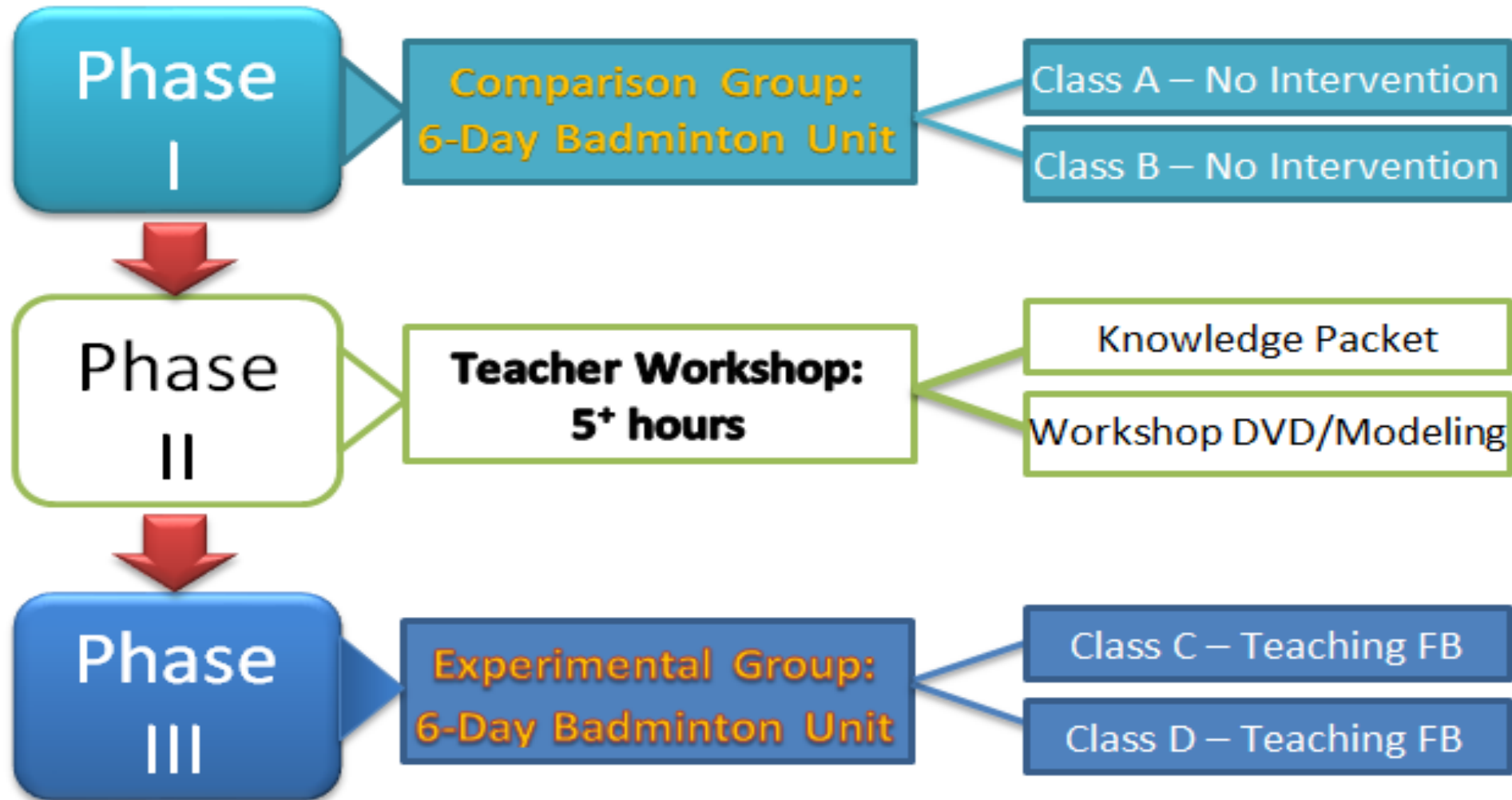
- Examine the effects of a badminton CK workshop on teachers' PCK and student learning
- Two main research questions
 - a) Are there any differences in teachers' PCK before and after the CK badminton workshop?
 - b) Are there any differences in students' correct performance trials between comparison and experimental groups?



Participants



Research design



Independent Variable

Badminton CK Workshop:
5+ hours



Teaching
Feedback

Knowledge Packet:

- Introduction to the workshop and Play Practice
- Rules and court dimensions
- Critical elements, common errors and error corrections of six primary skills and some tactics
- Tasks for a six-day badminton unit and a lesson note

Modeling: Watched Workshop DVD

- Explaining and demonstrating the CEs of each skill using visual and verbal representations
- Some common errors and error corrections
- Examples of developmentally and instructionally appropriate task progressions and task adaptations

Teacher Evaluation: Answer the questions

- Skill discrimination, error detection and correction
- Task presentation, progressions and adaptation

Specific feedback on
the teachers' teaching

- After each lesson with the experimental group



Dependent Variable

Teacher Variables

Task Maturity
Visual & Verbal Task
Presentation

Task Appropriateness
Developmental/Principal
Appropriate Task Selection

Task Adaptations
Inter/intra-Task
Adaptations

Student Variables

Correct Trials
Correct Performance
of the Skills within two or
three Phases

Incorrect Trials
Incorrect Performance of
the Skills within two or three
Phases

Other Trials
Missed Trials, Unfair
Opportunity & Non-Target
Performance



Data Collection

Student Data

- Coding the selected students' every trial using a live coding method

Teacher Data

- Coding all teacher variables using a video analysis method



Data Analysis

Student Variables

Descriptive Statistics
(i.e., means, ranges, and percentages)

Inferential Statistics (i.e. general linear model)
<Unit of Analysis: Individual students>

Teacher Variables

Descriptive Statistics
(i.e., means, ranges, and percentages)

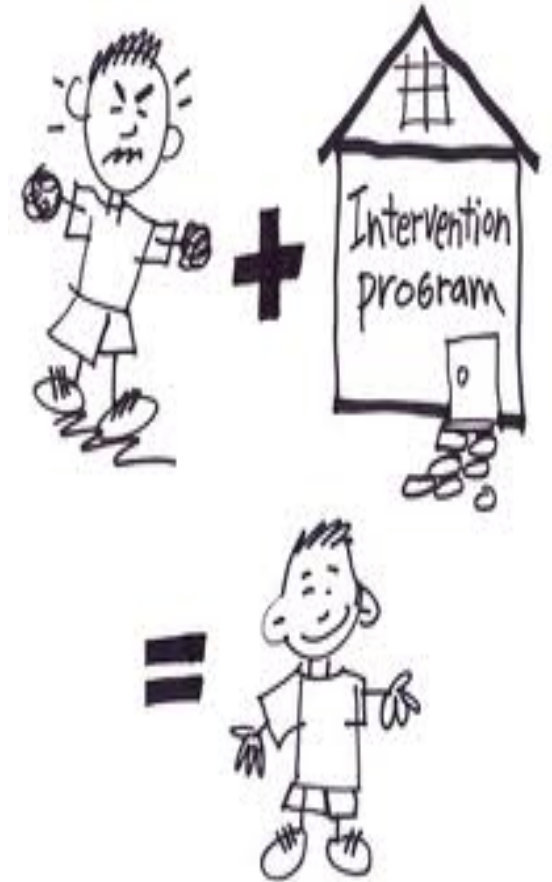
Inter Observer Agreement (IOA)

- Trained observers
- Performed 30% of all observations of each teacher and the students
- Acceptable criterion for IOA: 88%



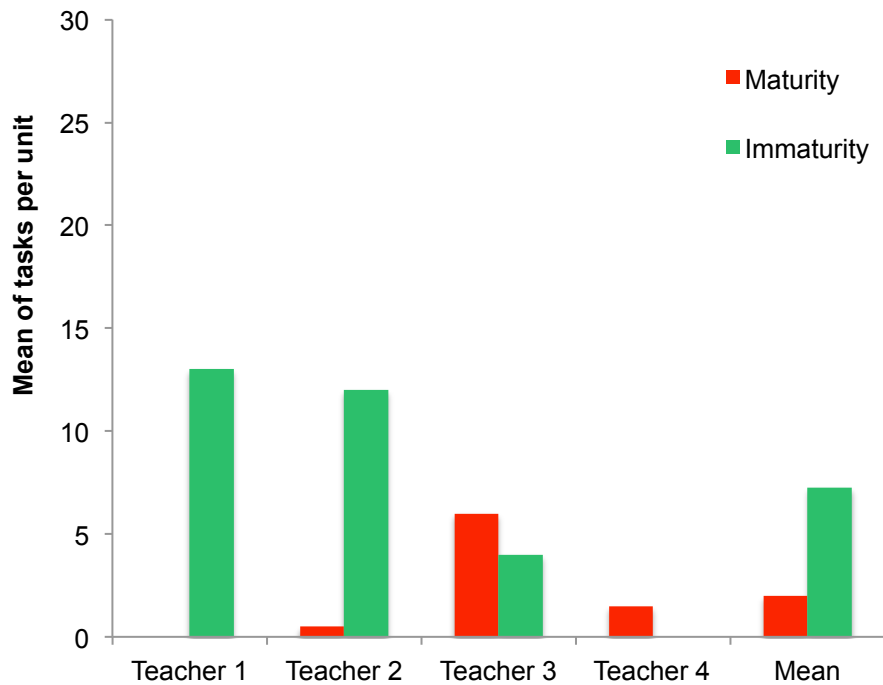
Conceptual Assumption 1

- Maturity of teacher's task representations varies along the continuum from immature to mature.

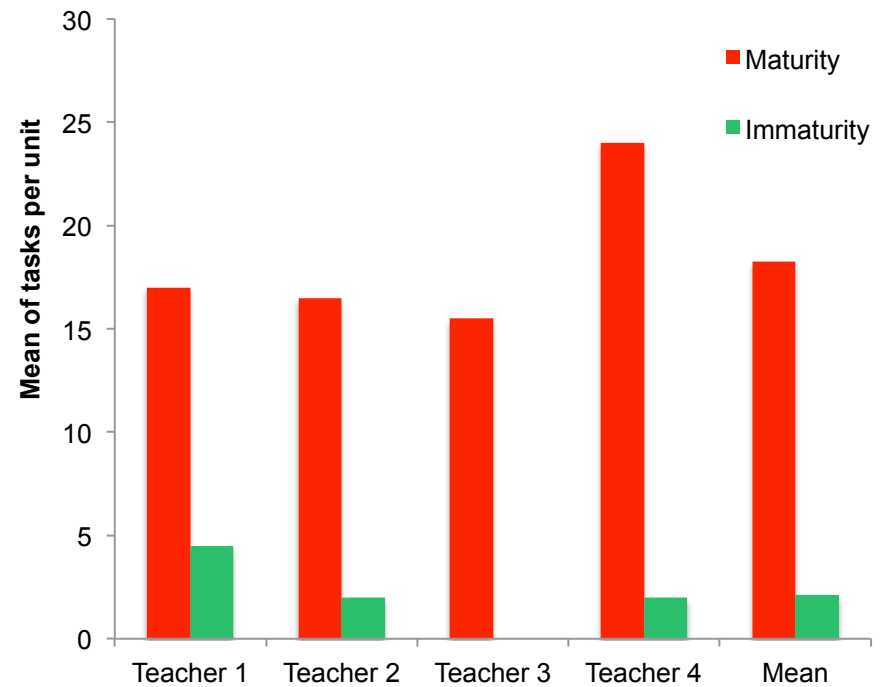


Results of Teachers' Task Maturity

Comparison

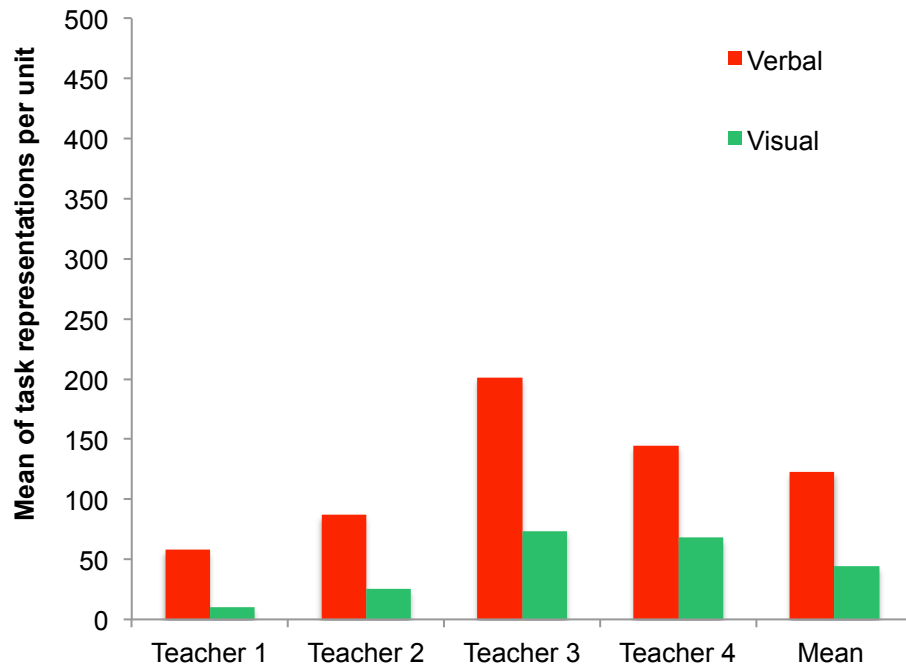


Experimental

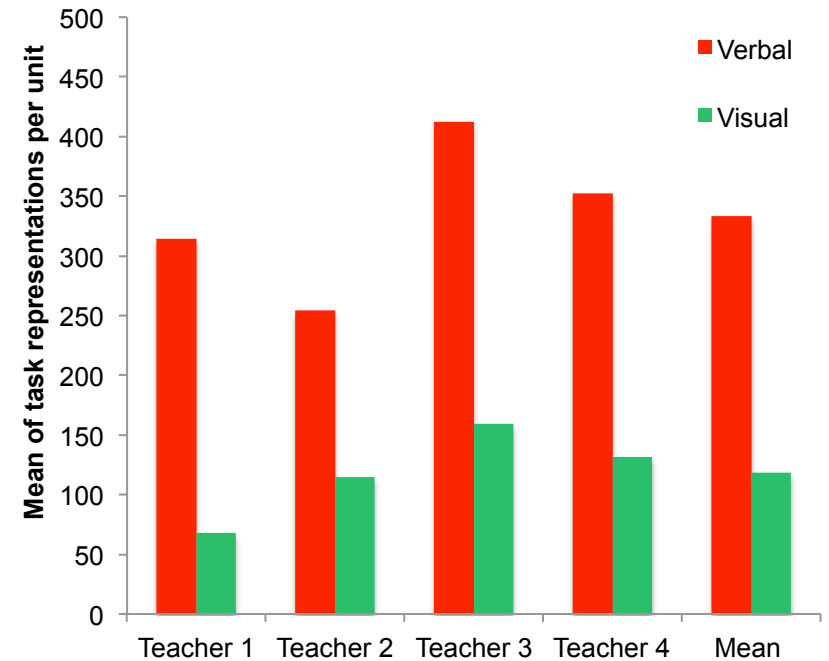


Results of Teachers' Verbal and Visual Task Representations

Comparison



Experimental



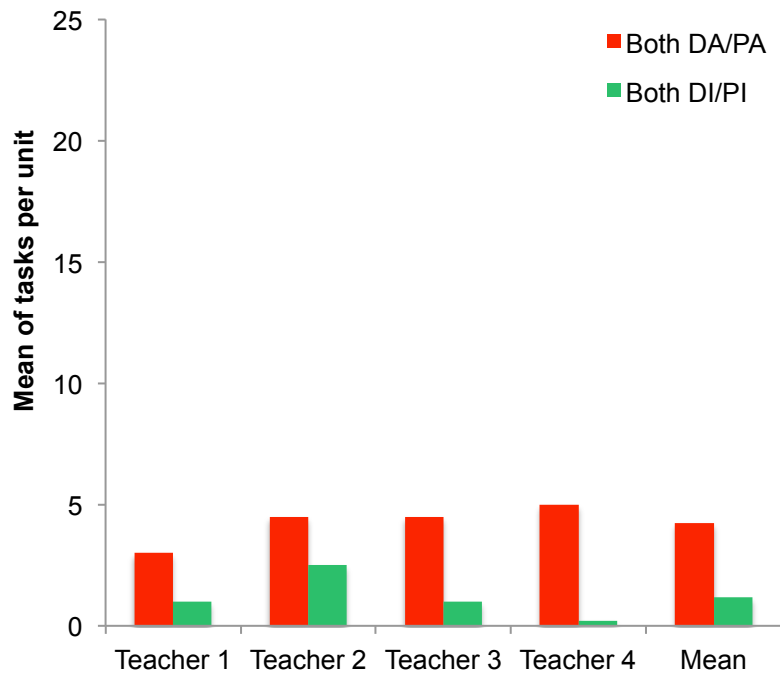
Conceptual Assumption 2

- Appropriateness of teachers' tasks varies along the continuum from immature to mature

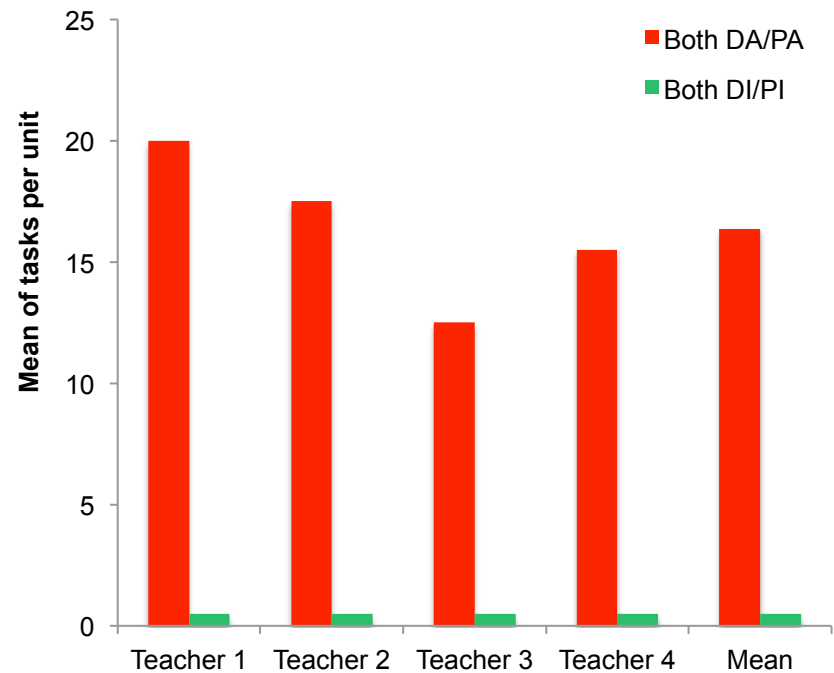


Results of Teachers' Task Appropriateness

Comparison



Experimental



Conceptual Assumption 3

- Teachers' inter and intra-task adaptations differentiate their PCK from weak to strong.

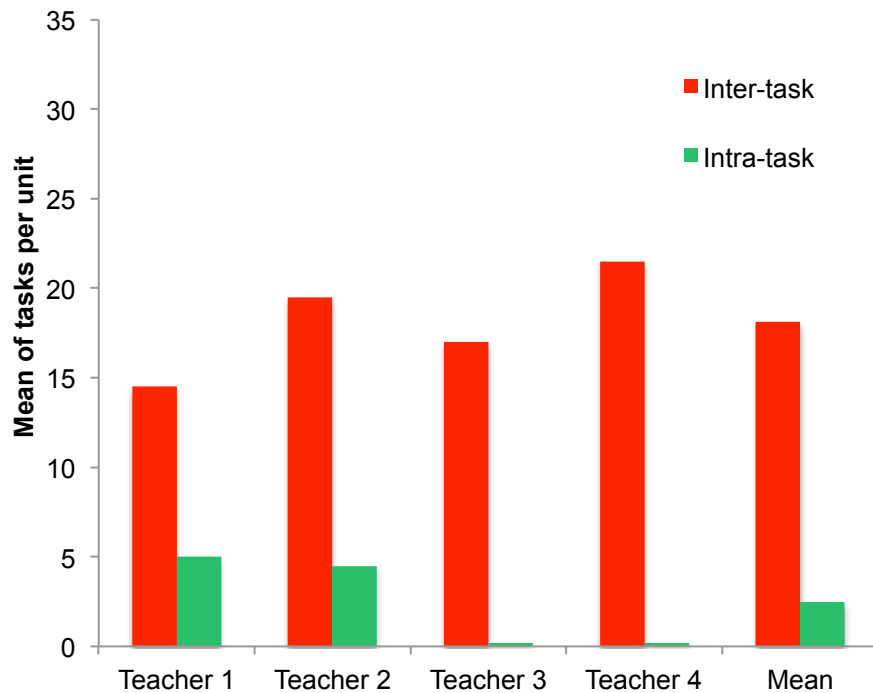


CONTENT DEVELOPMENT

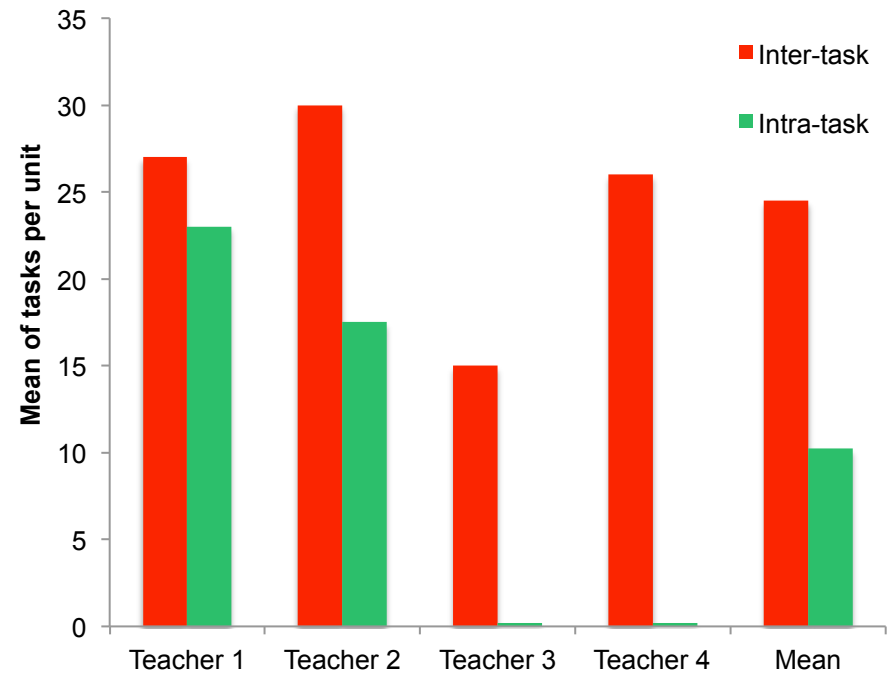


Results of Teachers Inter and Intra Task Adaptations

Comparison



Experimental



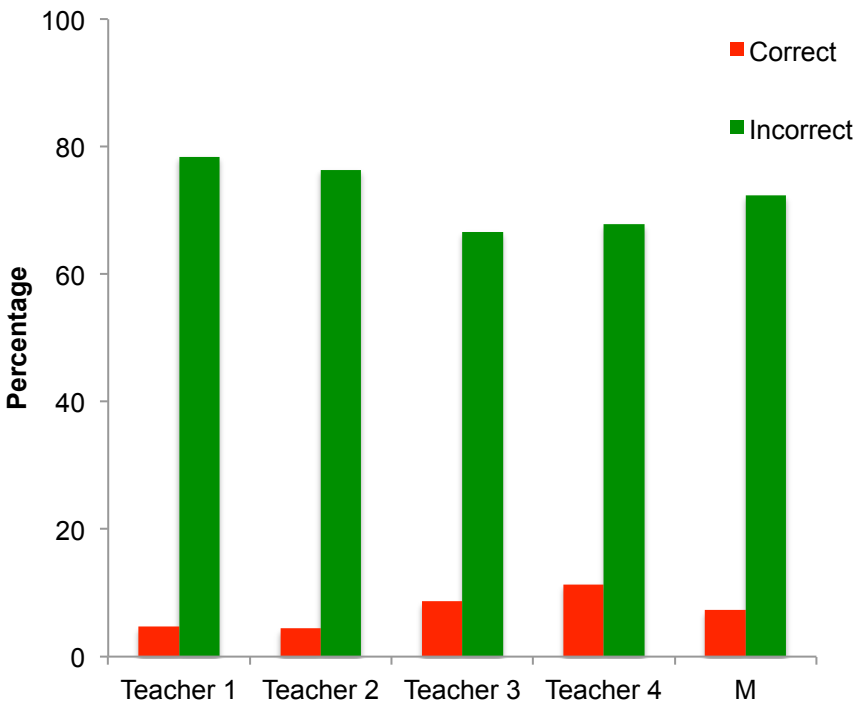
Conceptual Assumption 4

- PCK effectiveness (i.e., student achievement) varies along the continuum from ineffective to effective.

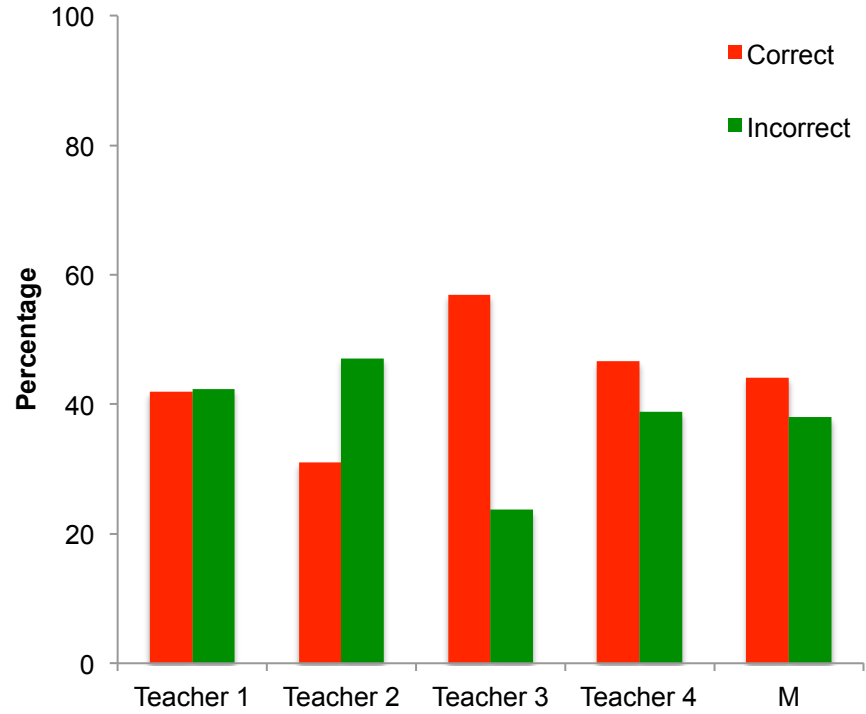


Results of the Percentage of Student Performances

Comparison



Experimental



Results of General Linear Model for Student Performances

| Source | | Mean Square | F | P |
|----------------------|---------------|-------------|--------|-------|
| Treatment | Correct (%) | 21854 | 1062 | .000* |
| | Incorrect (%) | 22867 | 184.31 | .000* |
| Skill level | Correct (%) | 2276 | 110 | .000* |
| | Incorrect (%) | 637 | 5.14 | .001* |
| Gender | Correct (%) | 417 | 20.3 | .000* |
| | Incorrect (%) | 268 | 2.17 | .122 |
| Treatment *Skill | Correct (%) | 414 | 20.2 | .000* |
| | Incorrect (%) | 131 | 1.06 | .383 |
| Treatment* Gender | Correct (%) | 13.83 | .67 | .424 |
| | Incorrect (%) | 83.8 | .68 | .512 |



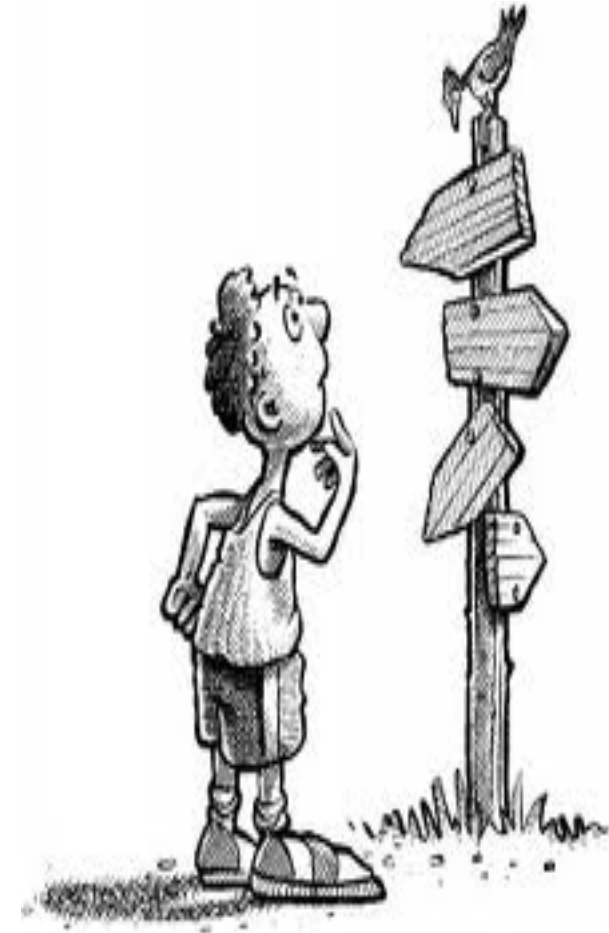
Conclusions

- Teachers' maturity of task representations exist along the continuum from immature to mature.
- Teachers' task appropriateness exist along the continuum from immature to mature.
- Teachers' task adaptations vary but differentiate their PCK.
- PCK effectiveness (i.e., student learning) varies along the continuum from ineffective to effective.
- Teachers' developed CK can influence the development of their PCK behaviors.
- Teachers' developed PCK can influence student learning.



Implications for Teacher Education

- Improving both CCK and SCK with specific practices in order to initiate the PCK development
- Providing relevant and specific feedback on teaching
- Developing CK using the CK packet
- Creating opportunities to develop the teachers' abilities to analyze the skills





Thank you

