

High Impact Practices(HIP), Learning Outcomes, and Students' Background

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Research Questions

1. What are the adequate measurement models of High Impact Practices (HIP) and Students' Self-Perceived Learning Abilities (SPLA) in the SERU?
2. How does students' HIP contribute to their SPLA and GPA when controlling family background ?
3. How is students' family background (1st generation, racial minorities, and household income) related to HIP and learning outcomes including SPLA and GPA?
4. Does HIP mediate between students' background and learning outcomes?

Analyses

- Exploratory Factor Analysis (EFA) & Confirmatory Factor Analysis (CFA) with Categorical Variables through the Robust Weighted Least Square Estimation , using Mplus for Construct Specification
- Testing for Reliabilities of Internal Consistency
- Multiple Indicator and Multiple Cause (MIMIC) Model

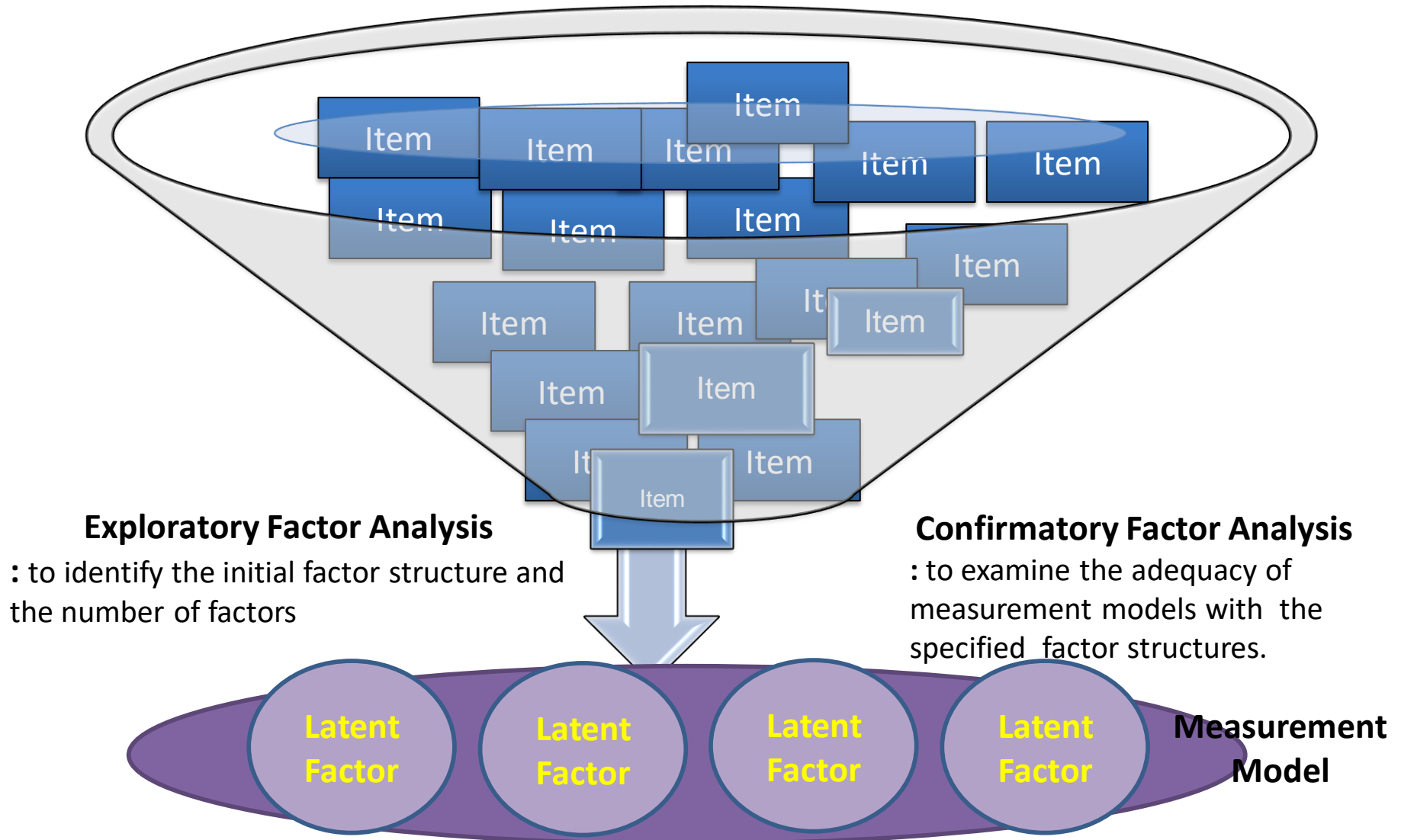
Data Source

- 2013 Student Experience in the Research University (SERU)
- 108, 344 students in 14 institutions: Indiana University, Purdue University, Rutgers University, Texas A&M University, University of Florida, University of Iowa, University of Michigan, University of Minnesota, University of North Carolina, University of Oregon, University of Pittsburgh , University of Southern California, University of Texas University of Virginia

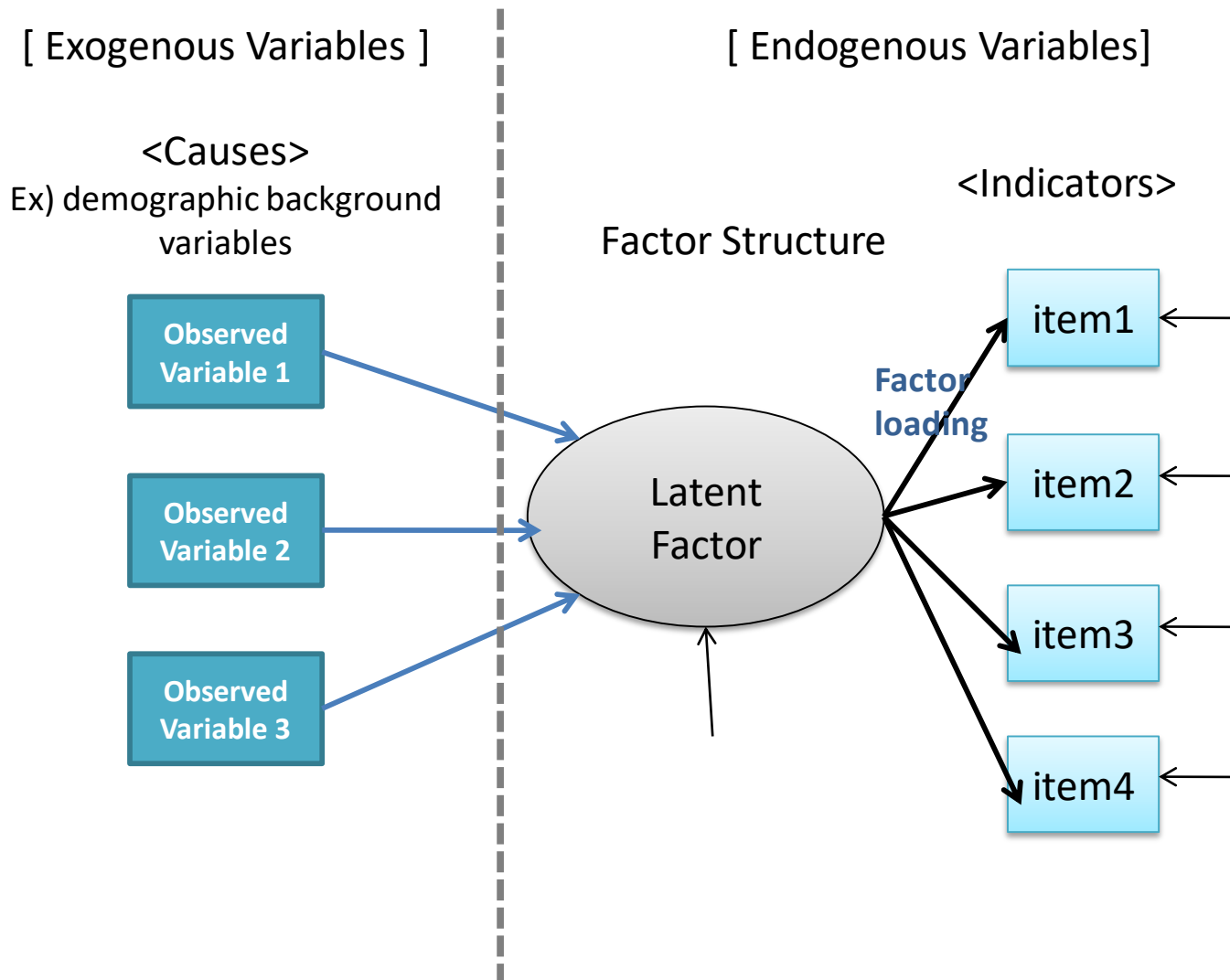
What is the Student Experience in the Research University (SERU)?

- Online survey instrument to generate new and longitudinal information about undergraduate experiences in research universities for use by administrators, policy makers, and scholars.
- Originated from the Center for Studies in Higher Education (CSHE) at the UC Berkeley, formed a consortium to administer the survey and share results.
- Aims to assess institutional functions, and to understand students' behavior, satisfaction, and achievement.
- Modular-based design including 5 thematic fields: Academic Engagement; Academic Experiences and Globalization; Civic Engagement; Students Development; Campus Climate for Diversity

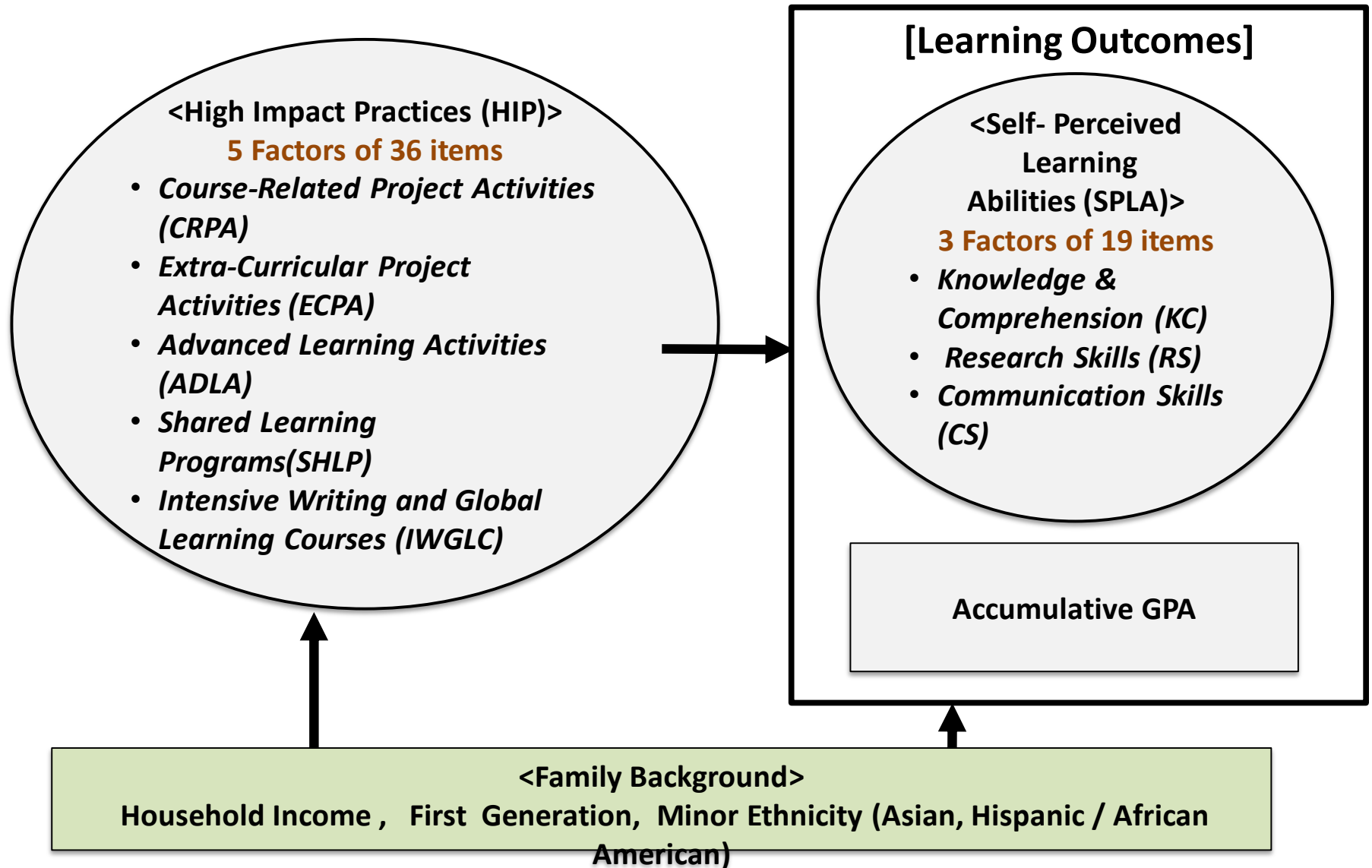
Factor Analyses



Multiple Indicator Multiple Cause Model



Research Model



High Impact Practices -1

Course-Related Project Activities	Reliability (α)	Factor Loadings
	.64	
A research project, creative activity, or paper as part of your coursework		.62
At least one student research course		.76
At least one independent study course		.70
Assist faculty in research with course credit		.81
Work on creative projects under the direction of faculty with course credit		.63
Extra-Curricular Project Activities	Reliability (α)	Factor Loadings
	.70	
Assist faculty in research for pay without course credit		.76
Assist faculty in research as a volunteer without course credit		.78
Work on creative projects under the direction of faculty for pay without course credit		.90
Work on creative projects under the direction of faculty as a volunteer without course credit		.84

High Impact Practices-2

Advanced Learning Activities	Reliability (α)	Factor Loadings
	.63	
Capstone or senior thesis courses		.65
Formal undergraduate research programs		.84
Formal creative activity or scholarship (such as in published collection, play, or gallery exhibit)		.70
Honors program		.47
Internship under the direction of a faculty member		.72
Other internship (e.g., coop, clinical assignment)		.46

High Impact Practices-3

Shared Learning Programs	Reliability (α)	Factor Loadings
	.56	
First-year seminar		.44
Learning community (two or more linked classes across a common theme)		.61
Reading a book that is common across the university (e.g. common book)		.52
Service learning or community-based learning		.72
Living-learning programs		.72

Intensive Writing and Global Courses	Reliability (α)	Factor Loadings
	.54	
Writing-intensive courses		.66
Courses that involve themes related to diversity or global learning		.86
Enrolled in a course with an international/global focus		.57

Students' Perceived Learning Abilities

Knowledge & Comprehension		Factor Loadings
Reliability (α): .76		
Analytical and critical thinking skills		.76
Ability to read and comprehend academic material		.75
Ability to be clear and effective when writing		.70
Understanding of a specific field of study		.65
Ability to understand international perspectives (economic, political, social, cultural)		.55
Quantitative (mathematical and statistical) skills		.33
Research Skills		Reliability (α): .78
Other research skills		.85
Library research skills		.76
Internet skills		.57
Computer skills		.50
Communication Skills		Reliability (α): .77
Interpersonal (social) skills		.69
Ability to lead		.70
Ability to prepare and make a presentation		.76
Ability to speak clearly and effectively in English		.57

Measurement Model Fit

High Impact Practices

X²/DF 16189.414/220

Comparative Fit Index (CFI) .931

Root Mean Square Error of
Approximation (RMSEA) .027

Students' Perceived Learning Abilities

X²/DF 14189.934/73

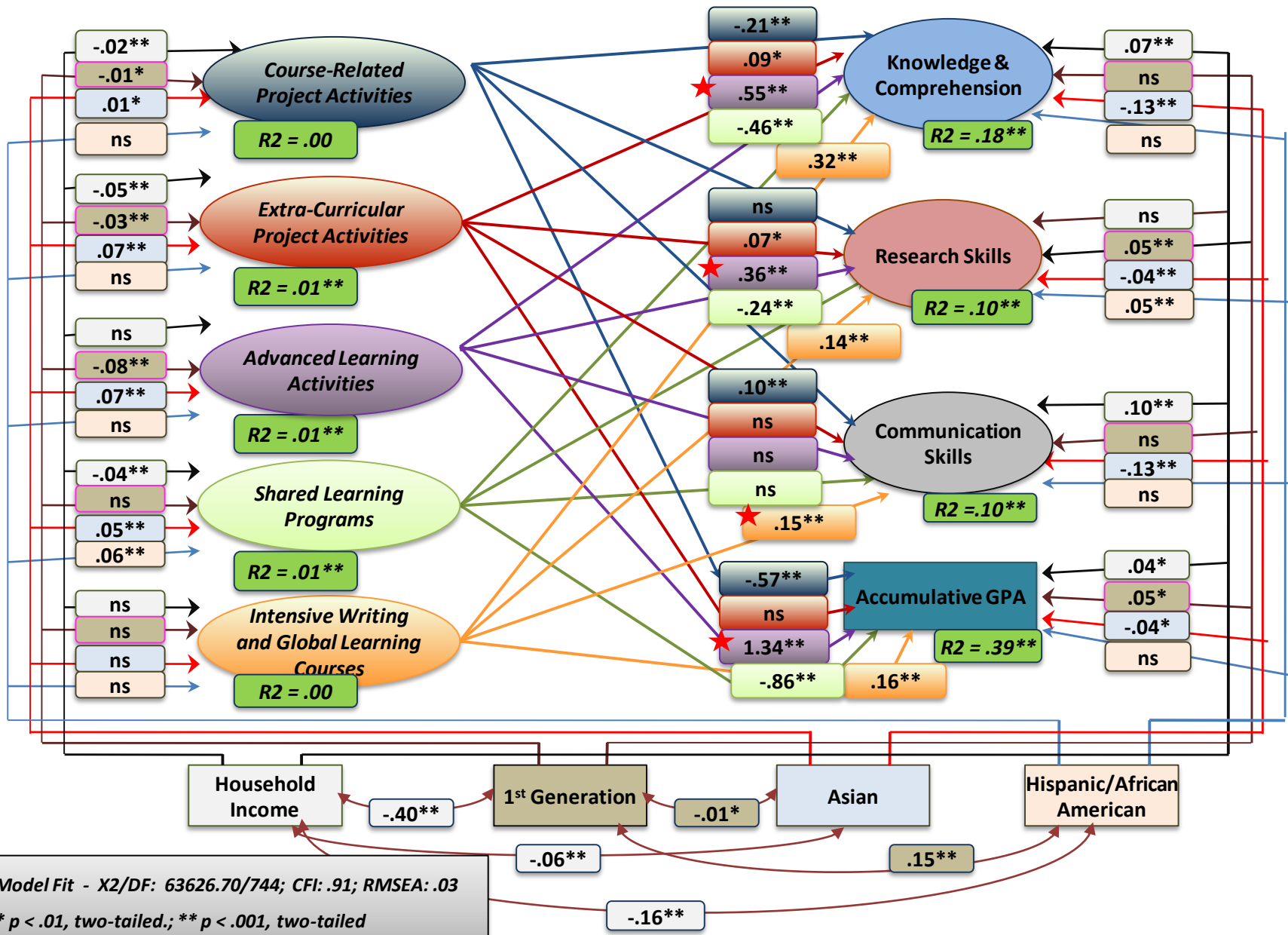
Comparative Fit Index (CFI) .915

Root Mean Square Error of
Approximation (RMSEA) .074

Correlations Among Students' Background, HIP, & Learning Outcomes

Learning Outcome HIP & Family Background	Knowledge and Comprehension	Research Skills	Communication Skills	Cumulative GPA
course-related project activities	.18**	.24**	.19**	.07**
extra-curricular project activities	.14**	.21**	.13**	.06**
advanced learning activities	.25**	.26**	.20**	.31**
shared-learning programs	.08**	.13**	.16**	ns
Intensive writing and global learning courses_	.26**	.16**	.22**	.10**
Household Income	.11**	ns	.11**	.11**
First Generation	-.07**	.02**	-.05**	-.10**
Asian	-.12**	-.02**	-.14**	ns
Hispanic /African American	-.02**	.04**	ns	-.10**

The Path Analyses (MIMIC Model)



Direct, Indirect, & Total Effects from Students' Background to Learning Outcomes

From Family Background	To Learning Outcome	Significant Mediator	Z	total indirect effect	direct effect	total
Household Income	Knowledge & Comprehension	CRPA	3.14*	.00 (ns)	.01**	.02**
		ECPA	-2.81*			
		SHLP	3.09*			
Household Income	Research Skills	ECPA	-2.80*	.00 (ns)	.00 (ns)	.00 (ns)
		SHLP	2.75*			
Household Income	Communication Skills	CRPA	-2.66*	.00 (ns)	.04**	.04**
Household Income	Accumulative GPA	CRPA	3.7**	.01 (ns)	.01*	.24**
		SHLP	3.15*			
First-Generation	Knowledge & Comprehension	ECPA	-2.53*	-.08**	.03 (ns)	-.04**
		ADLA	-4.96**			
First-Generation	Research Skills	ECLP	-2.51*	-.06**	.08**	.03**
		ADLA	-4.11**			
First-Generation	Communication Skills	NA	NA	-.02*	.00 (ns)	-.02*
First-Generation	Accumulative GPA	CRPA	2.602*	-.26**	.12*	-.15**
		ADLA	-5.77**			

** p < .01, two-tailed.; ** p < .001, two-tailed ; CRPA : Course-Related Project Activities; ECPA : Extra-Curricular Project Activities; ADLA: Advanced Learning Activities; SHLP: Shared Learning Programs*

Direct, Indirect, & Total Effects from Students' Background to Learning Outcomes-Continued

From Family Background	To Learning Outcome	Significant Mediator	Z	total indirect effect	direct effect	total
Asian	Knowledge & Comprehension	ECPA	2.912*	.03*	-.23**	-.20**
		ADLA	4.92**			
		SHLP	-4.01**			
Asian	Research Skills	ECPA	2.90*	.05**	-.11**	-.06**
		ADLA	4.13**			
		SHLP	-3.35**			
Asian	Communication Skills	NA	NA	.02 (ns)	-.40**	-.39**
Asian	Cumulative GPA	ADLA	5.68**	.12*	-.13*	-.01 (ns)
		SHLP	-4.18**			
Hispanic /African American	Knowledge & Comprehension	SHLP	-4.7**	-.05**	.02(ns)	-.03**
Hispanic /African American	Research Skills	SHLP	-3.73**	-.05*	.15**	.10**
Hispanic /African American	Communication Skills	NA	NA	.01 (ns)	.03 (ns)	.04*
Hispanic /African American	Cumulative GPA	SHLP	-4.89**	-.21**	-.05(ns)	-.26**

** p < .01, two-tailed.; ** p < .001, two-tailed ; CRPA : Course-Related Project Activities; ECPA : Extra-Curricular Project Activities; ADLA: Advanced Learning Activities; SHLP: Shared Learning Programs*

Findings

- The factorial structures of High Impact Practices (HIP) and students' Self-Perceived Learning Abilities (SLPA) yielded the adequate measurement models showing acceptable construct validity.
- All HIP were found to be positively but weakly correlated with all of students' SPLA and GPA except for the non significant correlation between “shared learning programs” and GPA.
- In general, family background doesn't practically influence students' engagement in HIP even though Asian students tend to engage in HIP more than Hispanic or African American students do.
- When controlling students' family background, “advanced learning activities” and “intensive writing and global” had the strongest effects on students learning outcomes (i.e., SPLA and GPA).

Findings- Continued

- Household income negatively or non significantly influenced engagement in high impact practices (HIP), thus exerting no indirect effects on learning outcomes via HIP; but having direct impacts on “knowledge and comprehension”, “communication skills”, and GPA.
- First-generation students were less likely or non significantly to engage in HIP and, thus, more likely to miss the advantages of HIP, particularly “advanced learning activities”, on their learning outcomes. First-generation students had lower levels of “knowledge and comprehension” and “communication skills”, and lower GPA than non-first-generation students.

Findings- Continued

- Asian students were more likely to engage in course-related and extra-curricular projects, and advanced learning HIPs which have positive indirect effects on their learning, but the direct effect of ethnicity on self-perceived learning abilities (SPLA) is negative.
- Hispanic or African American students did not significantly seem to engage in high impact practices (HIP) except for “shared learning programs” and thus failed to take advantage of the more powerful HIPs resulting in lower “knowledge and comprehension”, higher “research skills” and “communication skills”, and lower GPA.

Implications

- This study shows that it is possible to develop adequate measurement models to assess the effectiveness of High Impact Practices on student learning.
- Not all High Impact Practices are created equal. Advanced Learning Activities and Intensive Writing and Global Courses have the largest effects on student learning.
- Efforts need to be made to engage first-generation students in High Impact Practices.
- Efforts need to be made to steer Hispanic, or African American students to the HIPs that have larger direct effects on learning.

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