Active Learning Strategies Impact Curiosity in an Introductory Animal Sciences Course

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Introduction

- **Traditional Learning:** student passively receives knowledge (e.g. lecture)

- **Active Learning:** anything that involves students in doing things and thinking about the things they are doing (e.g. case studies, peer teaching, group projects)
- Increasingly used in higher ed

Bonwell & Eison, 1991

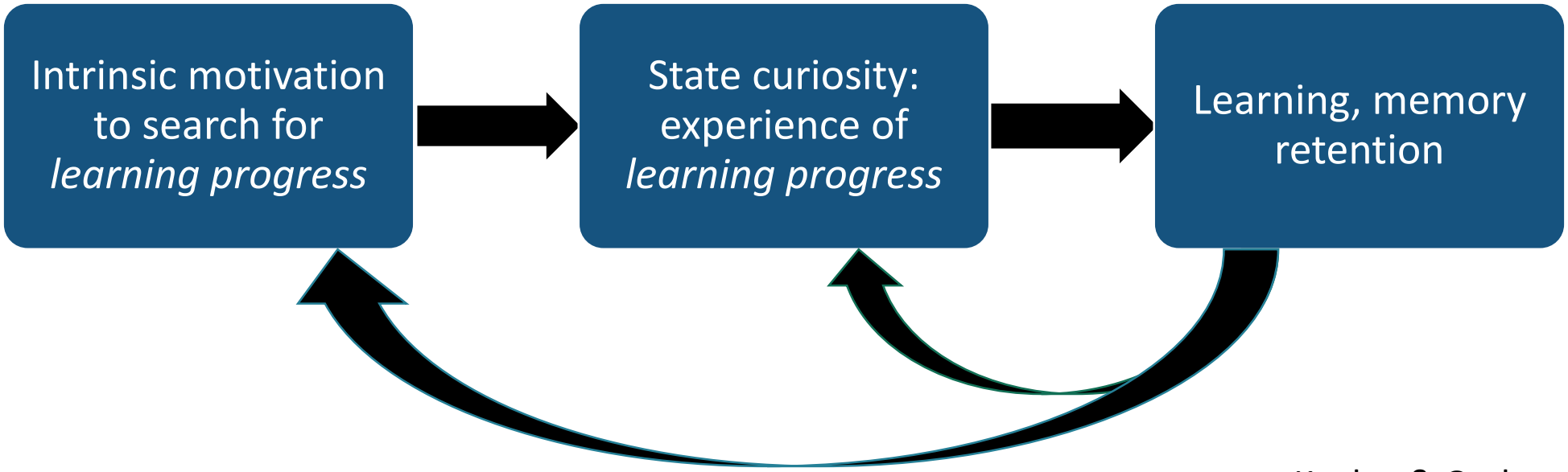
Introduction

- Active learning requires **curiosity**

- Curiosity: a form of intrinsic motivation that is key in fostering active learning and spontaneous exploration

Bonwell & Eison, 1991, Boscolo et all 2011

Learning progress hypothesis: positive feedback loop between curiosity and durable learning



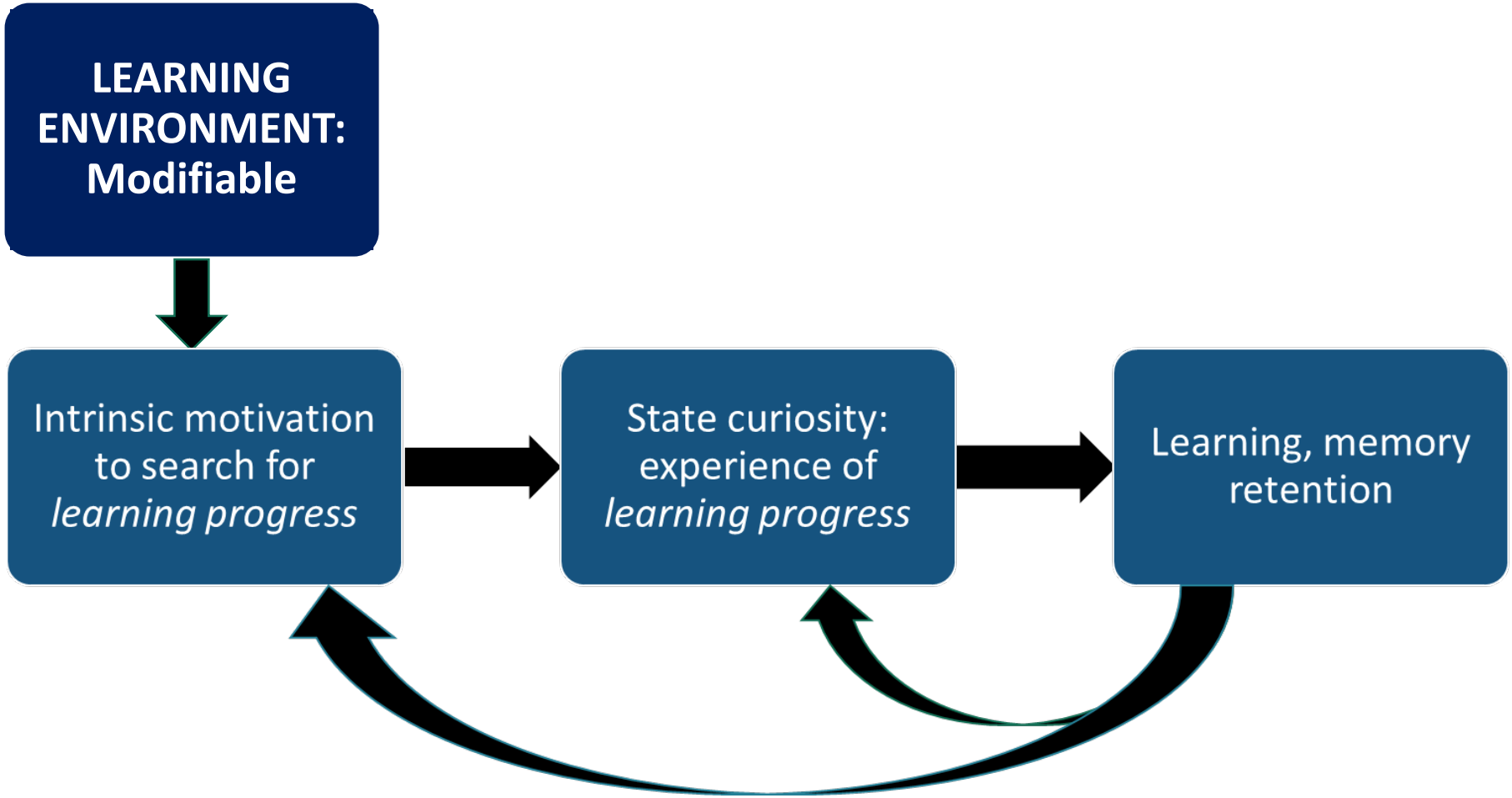
Kaplan & Oudeyer, 2007

Factors affecting curiosity

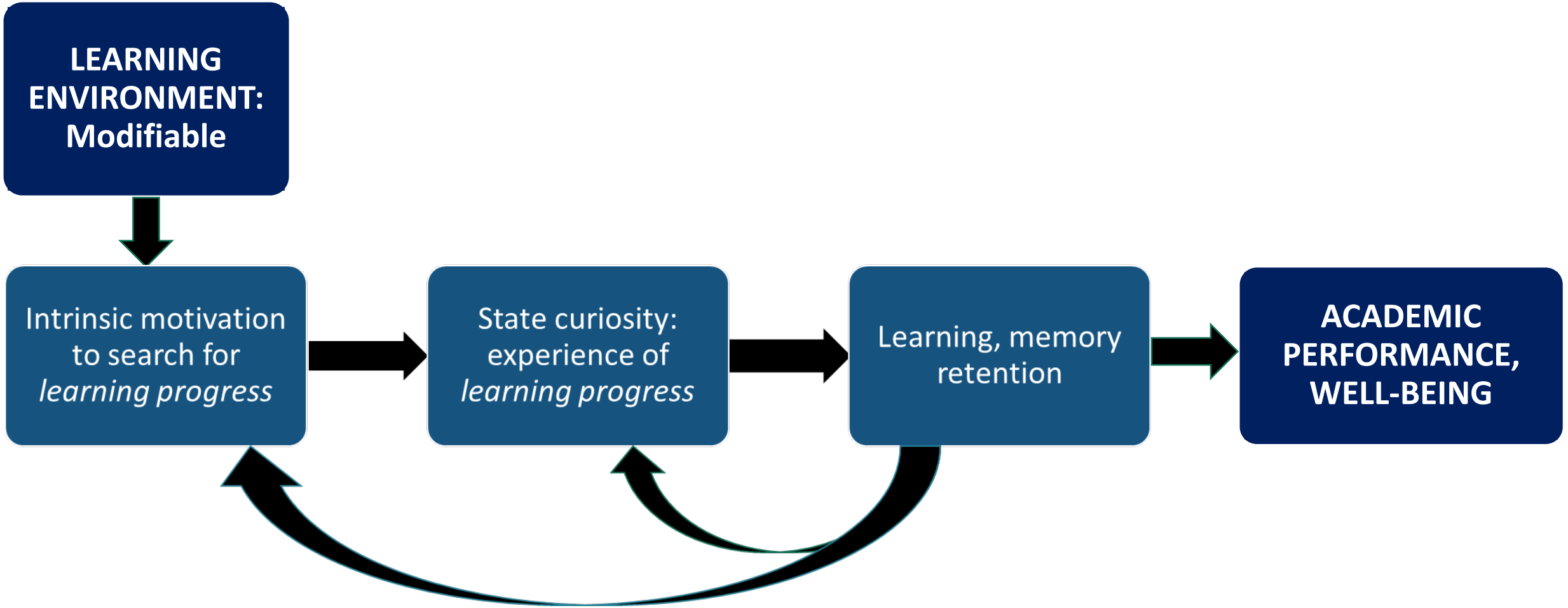
- **INTRINSIC to student**
  - Personality, disposition
  - Prior knowledge and experience

- **EXTRINSIC to student**
  - Classroom
  - Activities
  - Instructor
  - Students

Boscolo et al, 2011, Villiger et al, 2012



Kaplan & Oudeyer, 2007



Kaplan & Oudeyer, 2007

Interest in Animal Sciences

- Fewer students with farm background
- Reduced interest in food animal production
- Deficit in candidates to fill careers

- Cultivating early interest can influence college and career trajectory

Peffer, 2011

Objectives/Questions

- How do active learning strategies in an Intro to Animal Sciences Course impact student interest in studying animal sciences? Which strategies are most effective?

- How curious are students in studying animal sciences? Do levels change over the semester?

- Is curiosity level related to the perceived impact of active learning strategies?

Hypotheses

- Active learning strategies will increase student curiosity in animal sciences

- Active learning strategies will differ in their effects on student interest in animal sciences

Materials and Methods

Introduction to Animal Agriculture

- Introductory, required class

<u>Fall 2017</u>

- 238 students
- 79.3% females (n = 176)
- 75.7% freshmen (n = 168)
- 86.9% College of Agriculture (n = 193)
  Non-ANSC majors take to serve as STS university requirement

- **Lecture** - twice weekly 50-minute lectures
- **Lab** - weekly 110-minute laboratory sessions, ~50 students

Introduction to Animal Agriculture

- Shapes college career
- Opportunity to engage students early on

- Traditionally lecture-based, didactic
- Fall 2017 – Active learning elements added

Active Learning Additions

- Case studies
- Think-pair-share
- Exam review sessions
- iClicker Questions
- Laboratory stations
- Laboratory handouts
- Laboratory critical reflections

Methods

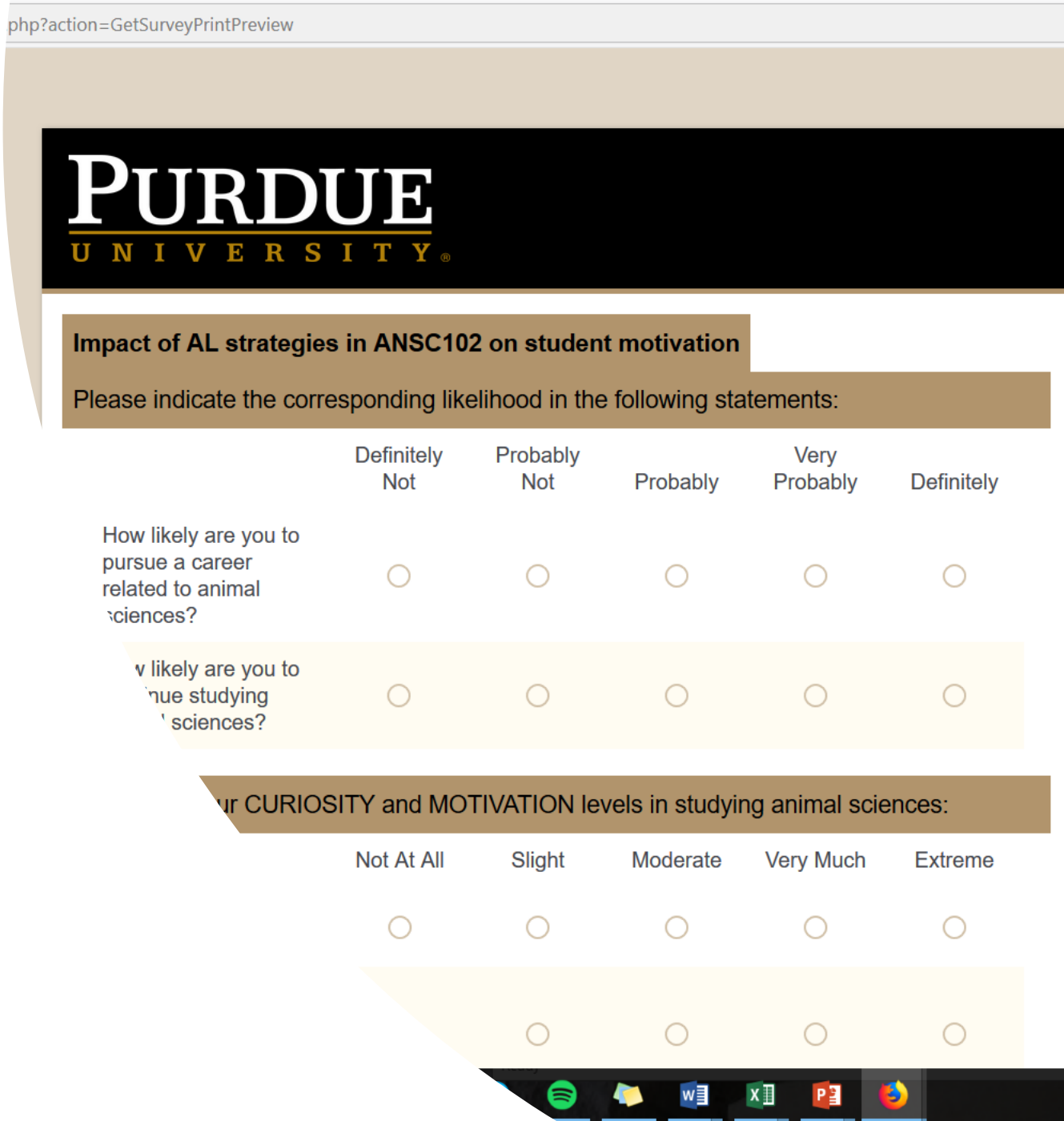
- Single group post-survey
- Administered via Qualtrics
- Response rate: n = 222, 93.2%

- Instrumentation
  - Self-assessment questionnaire
  - Likert scales

- All procedures were approved by Purdue's Institutional Review Board

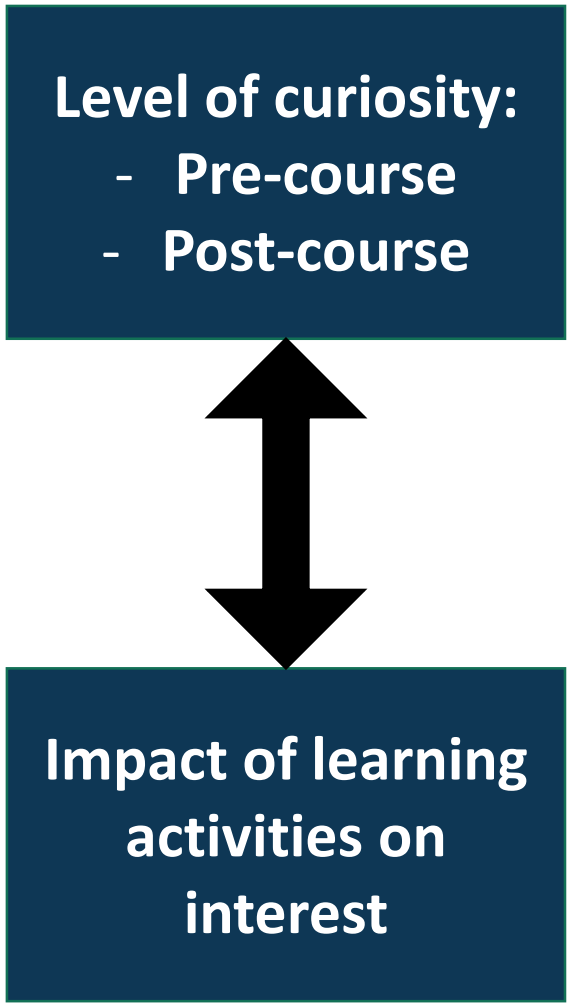
Questionnaire

- Current (end of semester) and beginning of semester curiosity in ANSC
  - Likert scale 1-5, “Not at All” to “Extreme”
- Impact of each of the active learning elements on interest in studying Animal Sciences
  - Likert scale 1-5, “Strong Negative Impact” to “Strong Positive Impact”



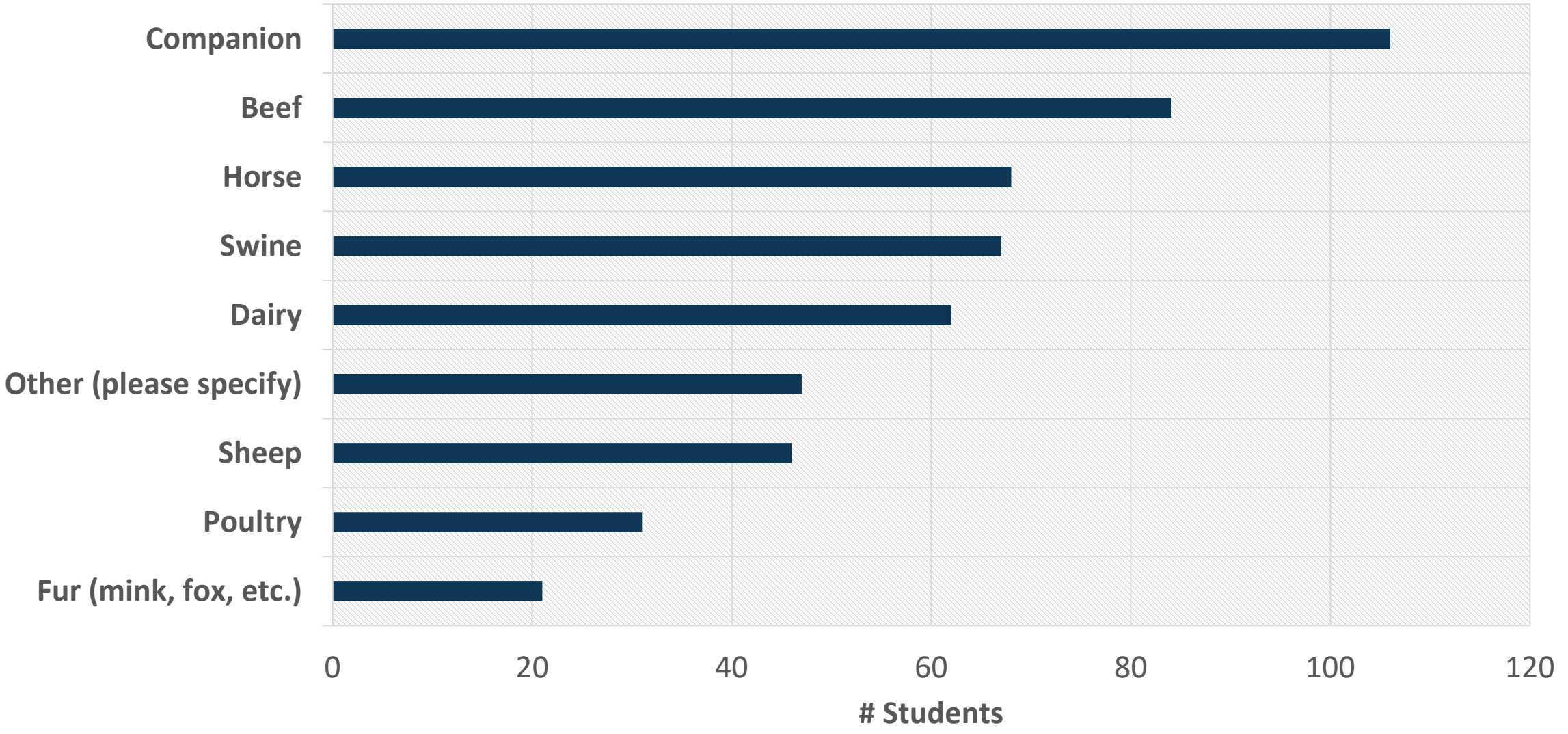
Statistical Analysis

- Paired t-test
  - Pre- vs post-course levels of curiosity
- Pearson correlation coefficients
  - Pre-course curiosity level
  - Post-course curiosity level
  - Impact of learning activities on interest
- P-value <0.05 considered significant



Results

Species of Interest (multiple selections possible)



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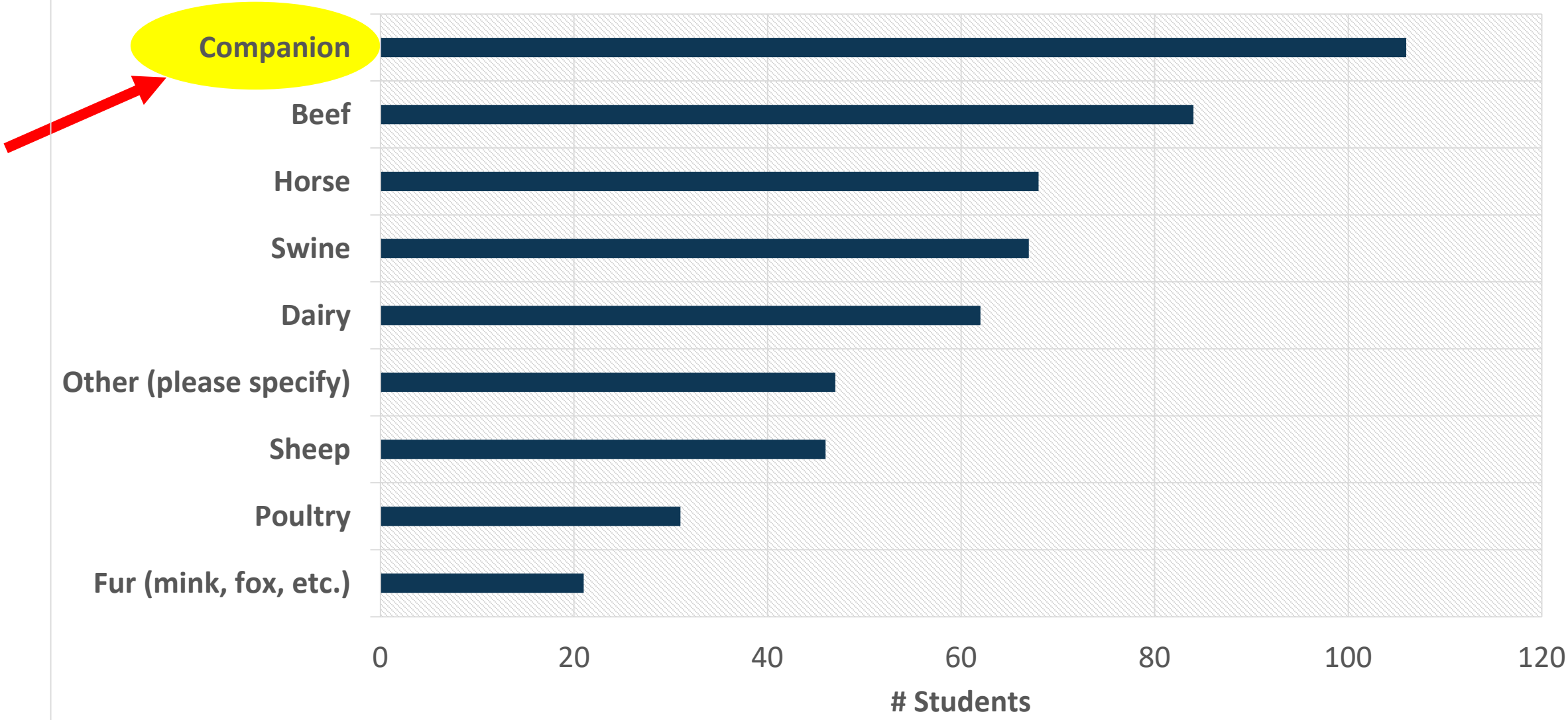
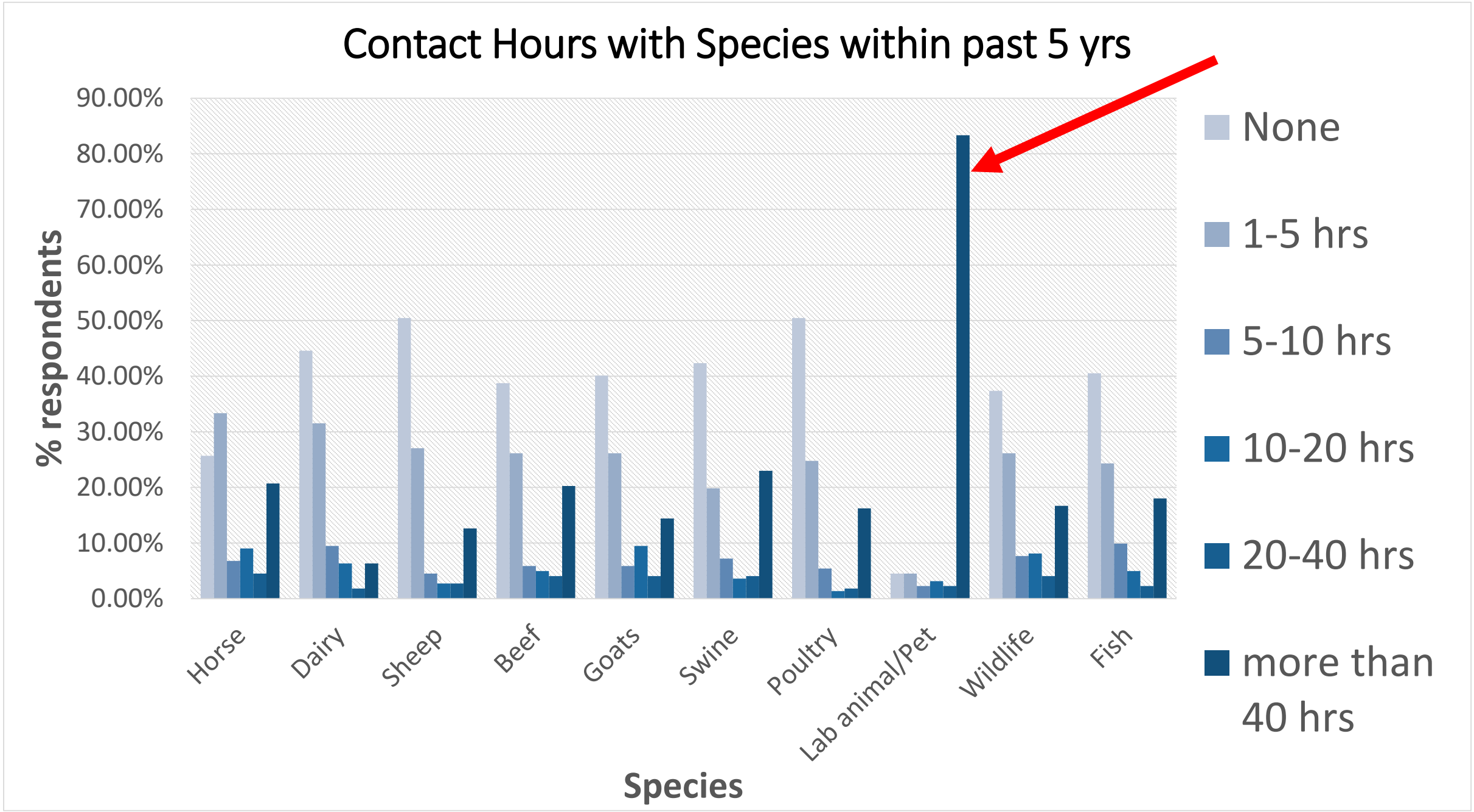
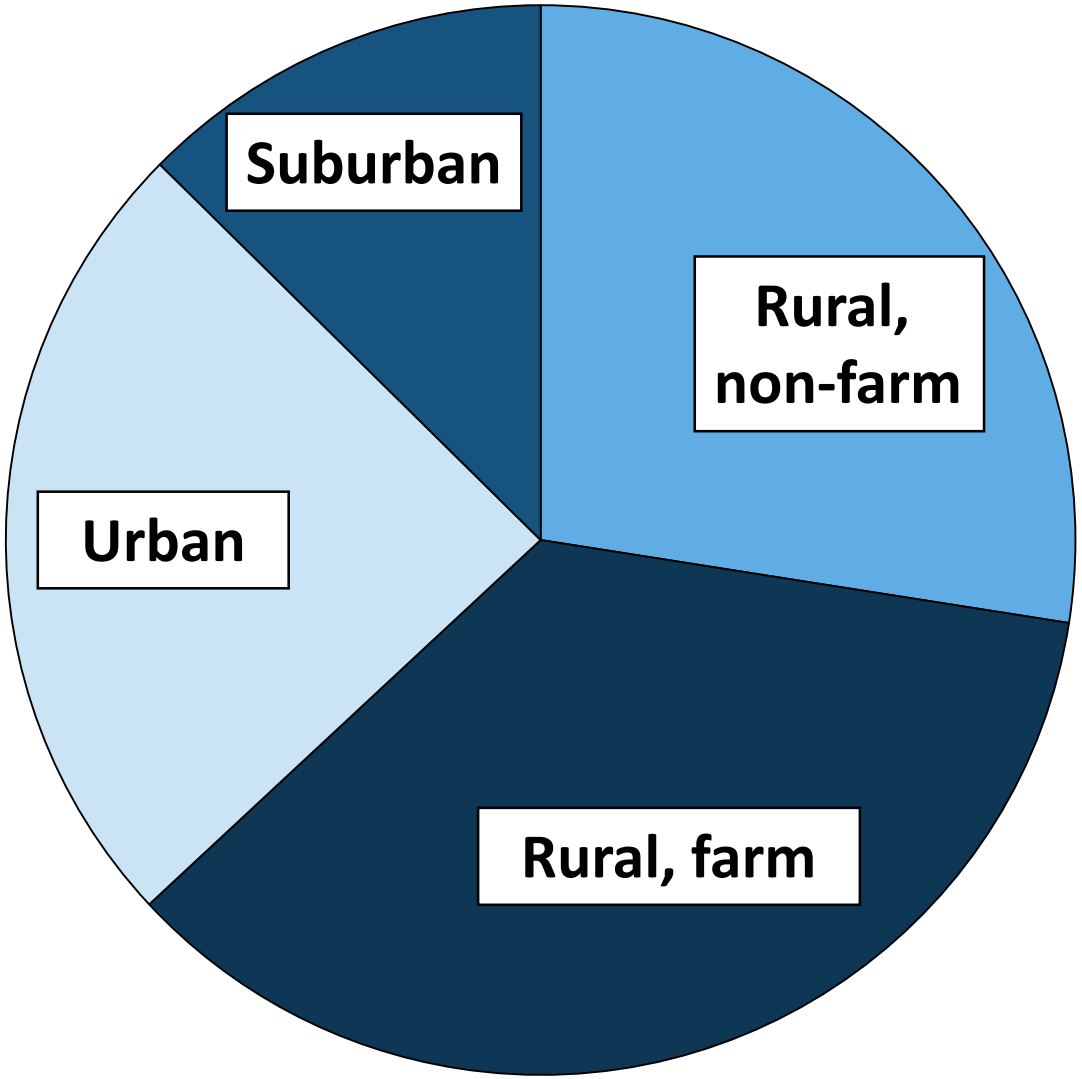


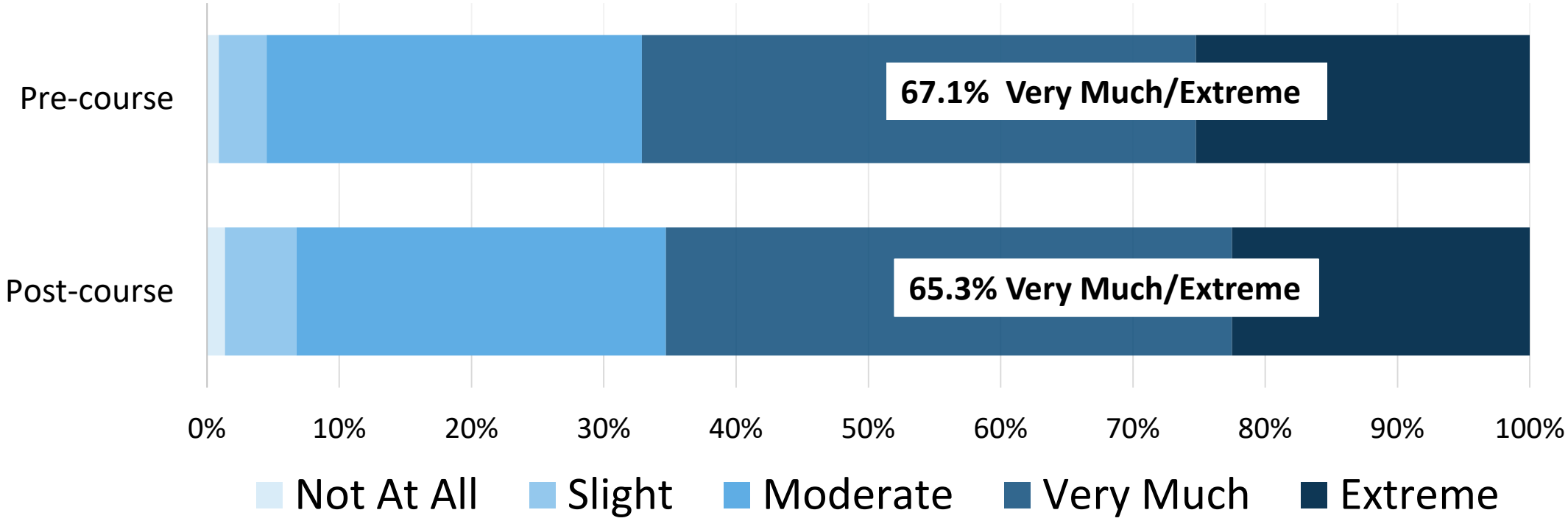

Contact Hours with Species within past 5 yrs
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
% respondents
Horse
Dairy
Sheep
Beef
Goats
Swine
Poultry
Lab animal/Pet
Wildlife
Fish
Species
None
1-5 hrs
5-10 hrs
10-20 hrs
20-40 hrs
more than 40 hrs



Background

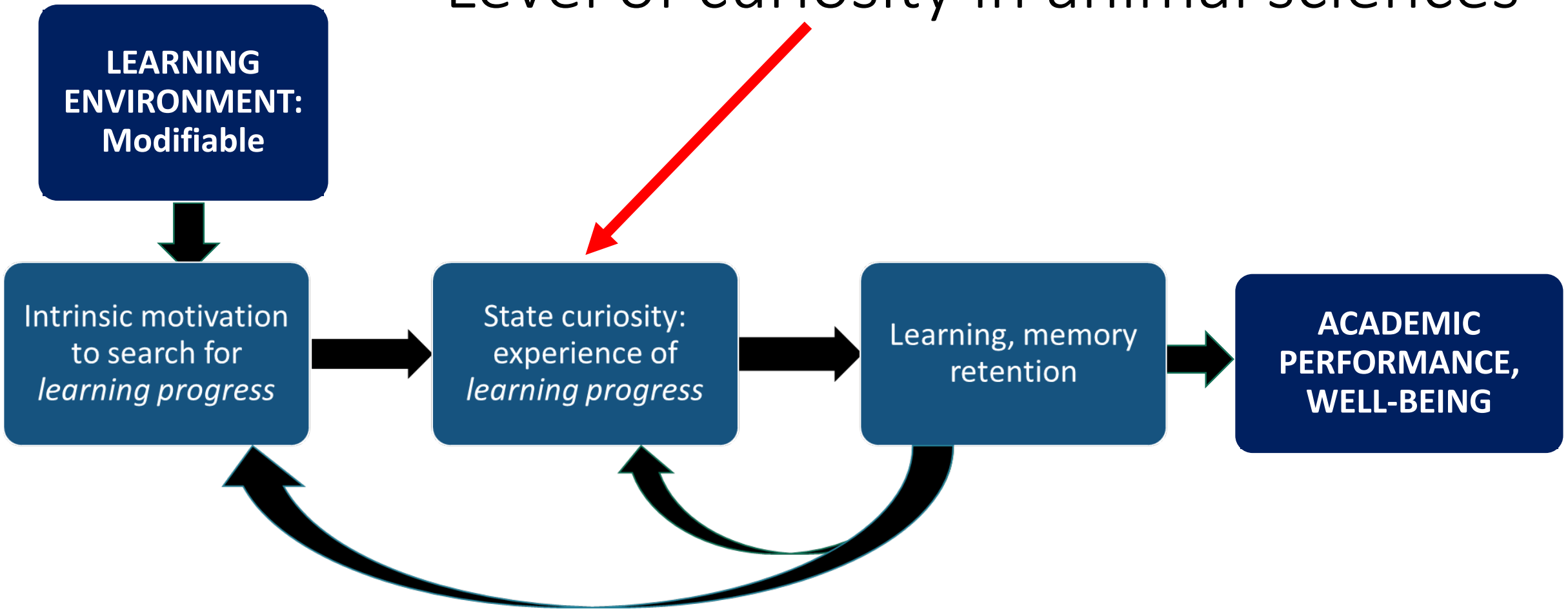
- 35.6% farm
- 64.4% non-farm

SELF-RATED LEVEL OF CURIOSITY IN ANIMAL SCIENCES



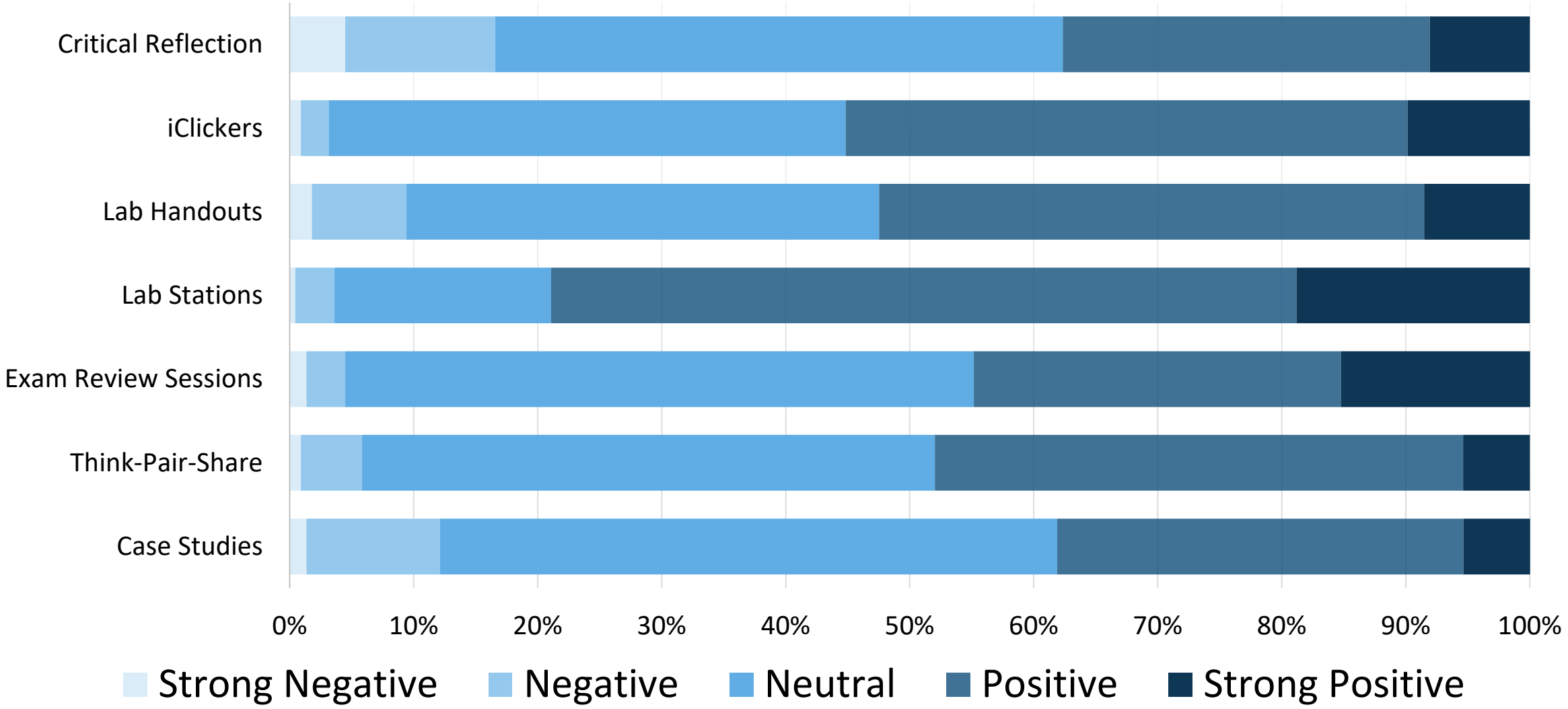
Paired t-test P = 0.1610

Level of curiosity in animal sciences



Kaplan & Oudeyer, 2007

IMPACT OF LEARNING ACTIVITIES ON INTEREST



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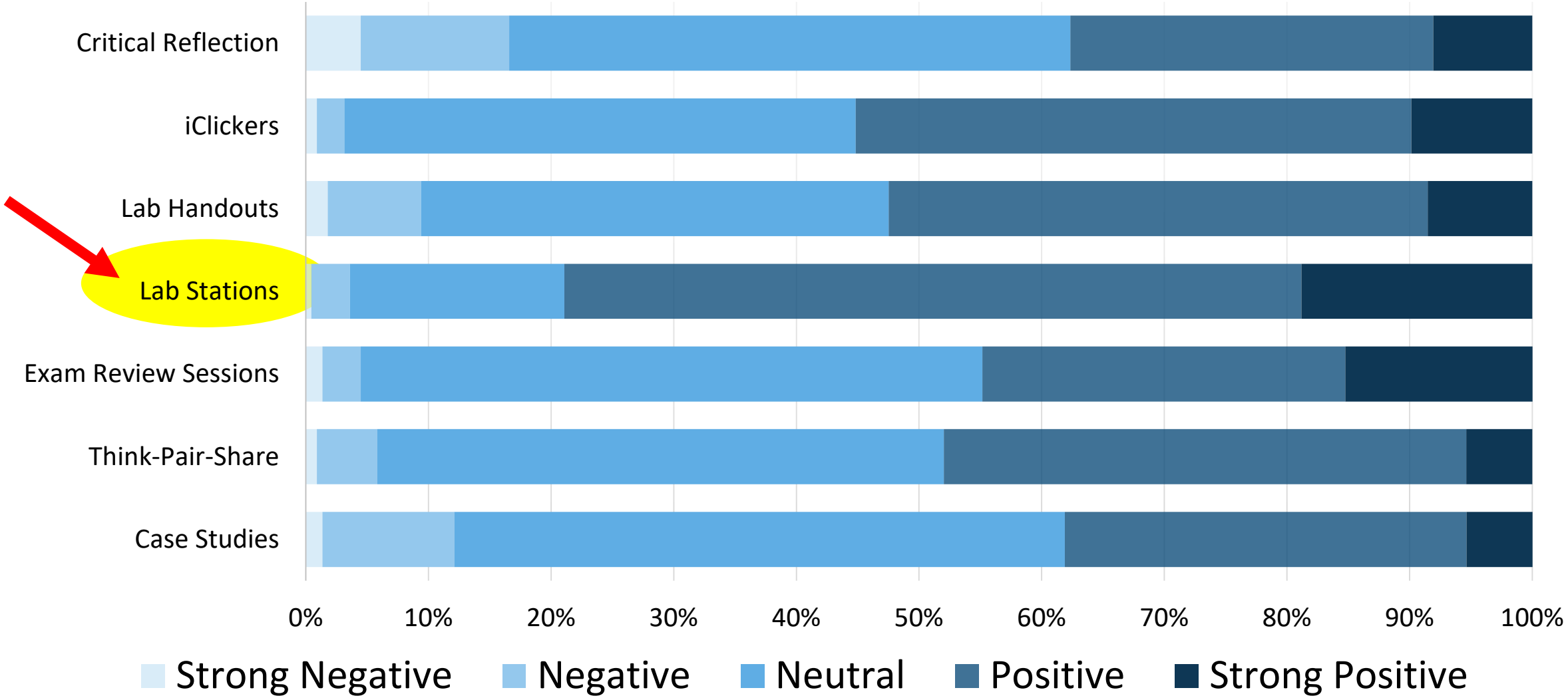
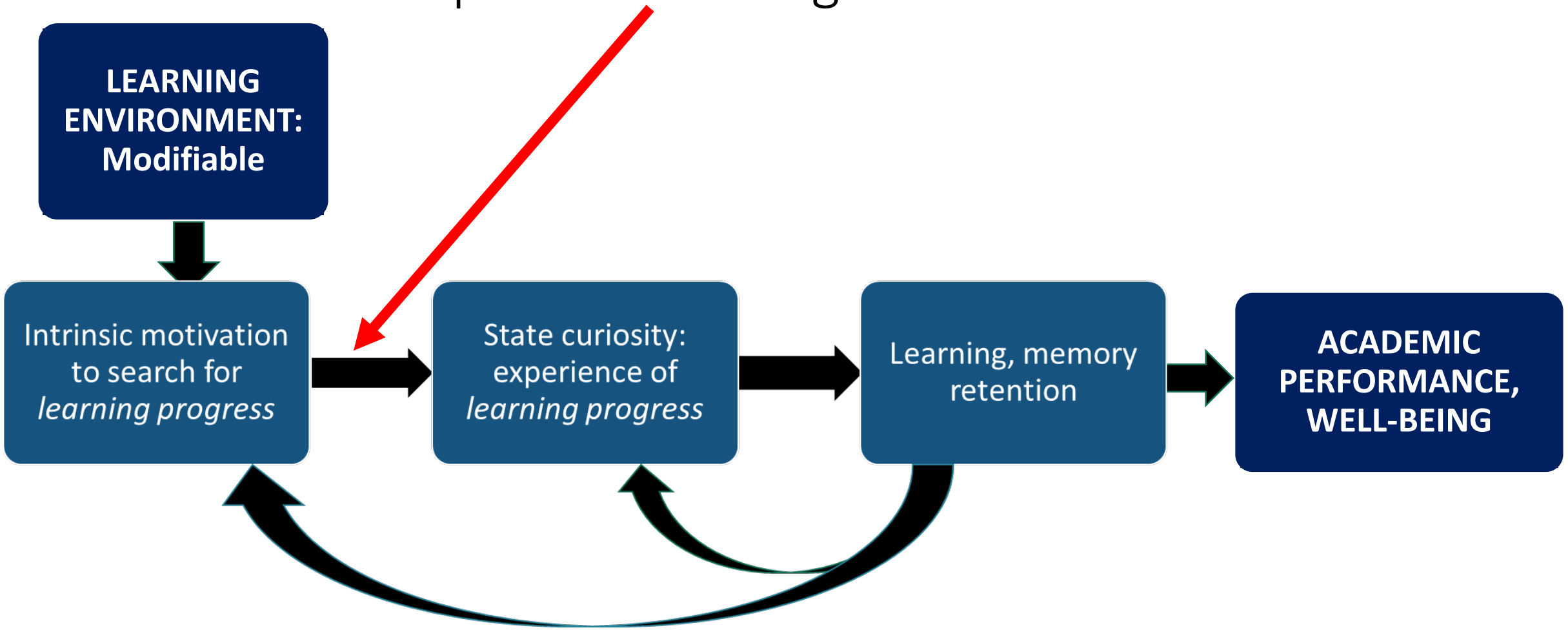


Relationship between curiosity level and impact of learning activities on interest

	Post-Course Curiosity	
Case Studies	0.37265	<0.0001
Think Pair Share	0.32889	<0.0001
Exam Review Sessions	0.16205	0.0157
Lab Stations	0.37725	<0.0001
Lab Handouts	0.25573	0.0001
iClickers	0.19295	0.0039
Critical Reflections	0.19236	0.0040

- All activities correlated with post-course curiosity level
- Most strongly correlated:
  - Case Studies
  - Think-Pair-Share
  - Lab Stations

Correlation between post-course curiosity level and impact of learning activities on interest



Kaplan & Oudeyer, 2007

Discussion

- Case studies, lab stations more active:
  - Realistic
  - Inquiry-based
  - Group work

- Perfetto et al 1983 – creates more transferable knowledge

Improvements to Animal Sciences Courses

> “The teaching and training of undergraduate students is still and will continue to be the most important function of animal husbandry departments."
>
> Brown, 1940

- More informed instructional strategies to support curiosity, especially in introductory courses
  - More time investment in activities shown to be effective
  - Development of additional activities with similar features

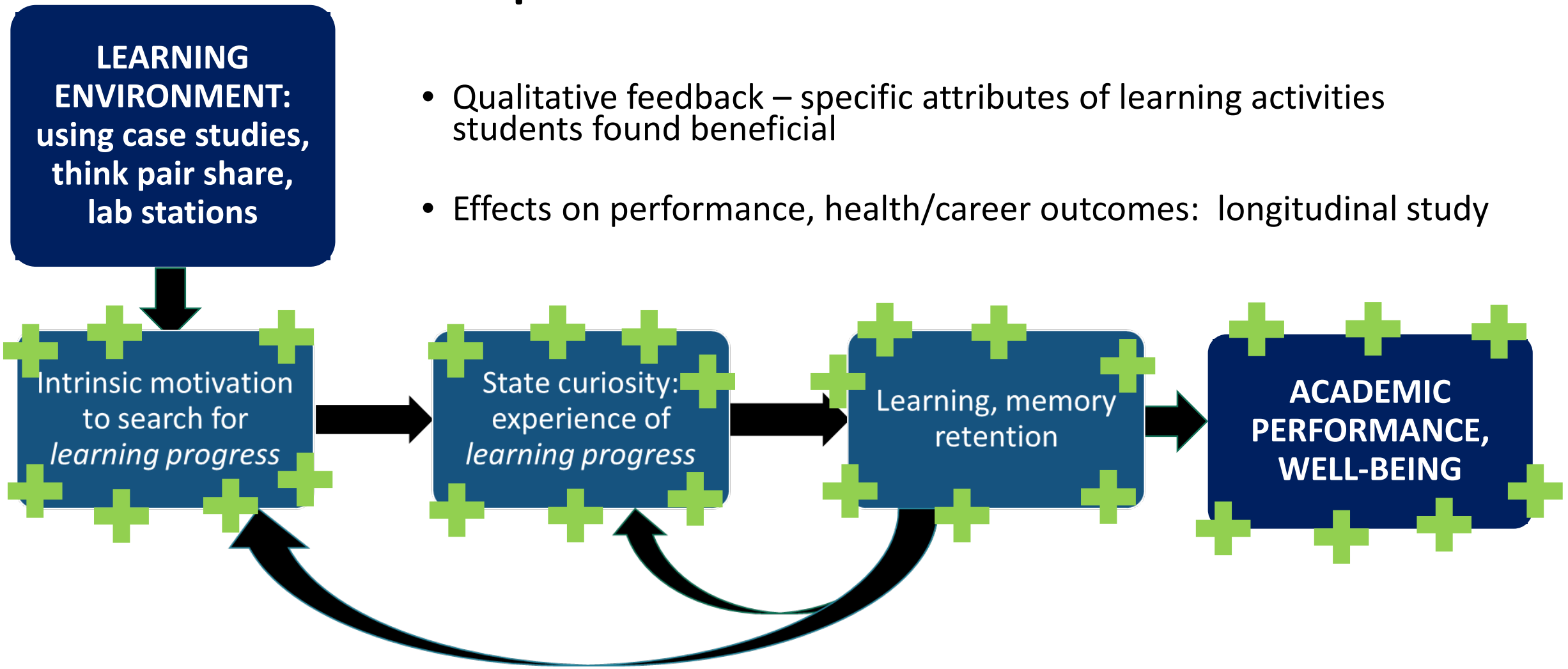
Conclusions

Active learning strategies stimulated more interest in students with higher levels of curiosity in ANSC

For students with higher levels of curiosity, more active, group-based learning strategies were the most effective of the learning strategies assessed

Implications and Future Research

- Qualitative feedback – specific attributes of learning activities students found beneficial
- Effects on performance, health/career outcomes: longitudinal study



Thank You

Questions?

- Kaplan, F. and Oudeyer, P-Y. (2007b)The progress-drive hypothesis: an interpretation of early imitation, In Dautenhahn, K. and Nehaniv, C., editor, Models and mechanisms of imitation and social learning: Behavioural, social and communication dimensions, pp.361–377, Cambridge University Press.
- Perfetto, B.A., Bransford, J.D. and Franks, J.J. (1983), 'Constraints on access in a problem solving context', Memory and Cognition, 11, 24-31.