

## 2019 Getting SMART about Adaptive Interventions in Education Agenda

Day 1 -- Monday, March 11, 2019		
Session	Time	Topic
<b>REGISTER &amp; NETWORK</b>	8:30 – 9:00 AM (30 min)	<b>Register and network over morning refreshments: bagels, fruit, coffee, tea</b>
<b>INTRO</b>  (Billie, Jackie, Stephanie)	09:00 – 09:20 AM (20 min)	<b>Introduction</b> <ul style="list-style-type: none"> <li>• Welcome &amp; brief introduction (Billie)</li> <li>• Introduction to IES (Jackie Buckley)</li> <li>• Course outline &amp; structure, small group assignment (Stephanie)</li> </ul>
<b>MODULE 1</b>  (Ahnalee, Shawna)	09:20 – 10:40 AM (80 min)	<b>Introduction to Adaptive Interventions (AIs)</b> <ul style="list-style-type: none"> <li>• What are AIs?</li> <li>• What are the components of an AI?</li> <li>• Compare simple vs deeply-tailored AIs</li> <li>• Why are AIs needed?</li> <li>• Examples of AIs in educational settings</li> <li>• Theory of change and its use in designing an AI</li> <li>• How do AIs inform educational practice?</li> </ul>
<b>BREAK</b>	10:40 – 10:50 AM (10 min)	<b>Break</b>
<b>DESIGN PRACTICUM</b>  (Ahnalee)	10:50 – 11:50 AM (60 min)	<b>Individual/Group Practicum</b> <ul style="list-style-type: none"> <li>• Develop initial AI in your area of study</li> <li>• Identify critical questions that need to be answered to develop a high-quality AI in your area of study</li> </ul>
<b>LUNCH</b>  (Billie)	11:50 – 1:00 PM (70 min)	<b>Working Lunch</b> <ul style="list-style-type: none"> <li>• 2 groups share their planned AI and scientific questions for discussion and feedback</li> <li>• Brief 1-on-1 meetings*</li> </ul>
<b>GUEST SPEAKER</b>	1:00 – 01:50 PM (50 min)	<b>Seminar on Adaptive Interventions in Education</b> <ul style="list-style-type: none"> <li>• Student to introduce speaker (5 minutes)</li> <li>• Speaker: <b>Dr. Veronica Fleury</b> (45 min)</li> </ul>
<b>BREAK</b>	01:50 – 02:00 PM (10 min)	<b>Break</b>
<b>MODULE 2</b>  (Ahnalee, Danny)	02:00– 03:20 PM (80 min)	<b>Experimental Design for Adaptive Interventions</b> <ul style="list-style-type: none"> <li>• Different trial designs for addressing scientific questions in AIs</li> <li>• Sequential Multiple Assignment Randomized Trial (SMART)</li> <li>• Selecting an appropriate experimental design</li> <li>• Discuss SMART design principles</li> <li>• Typical primary aims in a SMART</li> <li>• Sample size considerations in designing a SMART</li> <li>• Illustrate based on William Pelham’s IES-funded SMART in ADHD</li> </ul>
<b>DESIGN PRACTICUM</b>  (Danny)	03:20 – 04:35 PM (75 min)	<b>Individual/Group Practicum</b> <ul style="list-style-type: none"> <li>• Review your critical questions and sketch a design (not necessarily a SMART) to address them; Outline/sketch the argument/rationale for your proposed design (45 min)</li> <li>• 2 groups share their study design for discussion and feedback (30 min)</li> </ul>
<b>CLOSING</b>  (Danny)	04:35 – 05:05 PM (30 min)	<b>Day 1 Wrap-Up, 1-on-1 Meetings, and Homework Assignment</b> <ul style="list-style-type: none"> <li>• Homework: <ul style="list-style-type: none"> <li>○ Sketch a 1-page outline of the study’s specific aims</li> <li>○ Identify top 2 concerns a reviewer might raise</li> </ul> </li> <li>• Brief 1-on-1 meetings*</li> <li>• Day 1 evaluation</li> </ul>

\* One to two of the faculty members or content experts will be available to meet individually with interested scholars.

## Day 2 -- Tuesday, March 12, 2019

Session	Time	Topic
<b>NETWORK</b>	8:30 – 9:00 AM (30 min)	<b>Network over morning refreshments: bagels, fruit, coffee, tea</b>
<b>INTRO</b>  (Stephanie)	9:00 – 09:30 AM (30 min)	<b>Review Today’s Agenda, Homework Assignment and Questions from Day 1 Materials</b>
<b>CASE STUDIES</b>  (Danny, Shawna)	9:30– 10:30 AM (60 min)	<b>Novel SMART Case Studies:</b> <ul style="list-style-type: none"> <li>• RBT for Opioid-Dependent Pregnant Women</li> <li>• ExTEND SMART for alcohol dependence</li> <li>• SMARTer, for obese/overweight adults</li> <li>• ASIC: School-based CBT Implementation</li> </ul>
<b>BREAK &amp; PREPARATION</b>  (Nick)	10:30 – 10:50 AM (20 min)	<b>Prepare Computers for SAS Analysis</b>
<b>MODULE 3</b>  (Billie, Nick)	10:50– 12:00 PM (70 min)	<b>SMART Primary Aim Data Analyses, Part I</b> <ul style="list-style-type: none"> <li>• Discuss two common primary research questions in a SMART <ul style="list-style-type: none"> <li>○ Main effect of initial treatments</li> <li>○ Main effect of second-stage tactics</li> </ul> </li> <li>• Illustrate data analytics for addressing these research questions</li> <li>• SAS code and R code using simulated data based on William Pelham’s SMART in ADHD.</li> </ul>
<b>LUNCH</b>  (Billie)	12:00 – 01:00 PM (60 min)	<b>Working Lunch</b> <ul style="list-style-type: none"> <li>• Small group discussion</li> <li>• Brief 1-on-1 meetings*</li> </ul>
<b>MODULE 3 (CONT’D)</b>  (Billie, Nick)	01:00 – 02:00 PM (60 min)	<b>Continuation of Module 3: Primary Aim Data Analyses</b> <ul style="list-style-type: none"> <li>• Regression to obtain mean outcome under one embedded AI</li> <li>• SAS code and R code using simulated data based on William Pelham’s SMART in ADHD.</li> </ul>
<b>ANALYSIS PRACTICUM</b> (Nick)	02:00-2:30 PM (30 min)	<b>Practice Module 3 Data Analysis</b> <ul style="list-style-type: none"> <li>• Using simulated data based on Connie Kasari’s SMART in autism.</li> </ul>
<b>BREAK</b>	02:30 – 02:40 PM	<b>10 Minute Break</b>
<b>FROM THE EXPERT</b>	02:40 – 03:30 PM (50 min)	<b>SMART Case Study: SMART in ADHD</b> <ul style="list-style-type: none"> <li>• Student to introduce speaker (5 min)</li> <li>• Principal Investigator: <b>Dr. William Pelham</b> (45 min)</li> </ul>
<b>DESIGN PRACTICUM</b>  (Ahnalee)	03:30 – 04:45 PM (75 min)	<b>Individual/Group Practicum*</b> <ul style="list-style-type: none"> <li>• Using new knowledge with data analysis, refine your primary aim, sketch a description of your primary aim comparison, and outline an analysis plan (45 min).</li> <li>• 2 groups share their study design for discussion and feedback (30 min)</li> </ul>
<b>CLOSING</b>  (Danny)	04:45 – 05:15 PM (30 min)	<b>Day 2 Wrap-Up, 1-on-1 Meetings, and Homework Assignment</b> <ul style="list-style-type: none"> <li>• Homework: <ul style="list-style-type: none"> <li>○ Refine individual study design</li> <li>○ Refine description of your primary aim comparisons</li> <li>○ Sketch your primary aim data analysis plan</li> <li>○ Continue to think about concerns a reviewer might raise <ul style="list-style-type: none"> <li>▪ Sketch how you will address the concern(s) proactively?</li> </ul> </li> </ul> </li> <li>• Brief 1-on-1 meetings*</li> <li>• Day 2 evaluation</li> </ul>

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## Day 3 -- Wednesday, March 13, 2019

Session	Time	Topic
<b>NETWORK</b>	8:30 – 9:00 AM (30 min)	<b>Network over morning refreshments: bagels, fruit, coffee, tea</b>
<b>INTRO</b> <b>(Stephanie)</b>	09:00 – 09:50 AM (50 min)	<b>Review Today’s Agenda, Homework Assignment and Questions from Day 2 Material</b> <ul style="list-style-type: none"> <li>• 2 groups share their study design for discussion and feedback</li> </ul>
<b>MODULE 4</b> <b>(Billie, Nick)</b>	09:50 – 10:50 AM (60 min)	<b>SMART Primary Aim Data Analyses, Part II</b> <ul style="list-style-type: none"> <li>• Discuss two additional primary research questions in a SMART <ul style="list-style-type: none"> <li>◦ Regression to compare two AIs with different initial treatments</li> <li>◦ Regression to compare all embedded AIs simultaneously</li> </ul> </li> <li>• Illustrate using SAS code and R code</li> </ul>
<b>ANALYSIS PRACTICUM</b> <b>(Nick)</b>	10:50-11:20 AM (30 min)	<b>Practice Module 4 Data Analysis:</b> using fake data mimicking the autism study
<b>FROM THE EXPERT</b>	11:20 – 12:10 PM (50 min)	<b>SMART Case Study: AIM-ASD SMART in Autism</b> <ul style="list-style-type: none"> <li>• Student to introduce speaker (5 min)</li> </ul> Principal Investigator: <b>Dr. Connie Kasari</b> (45 min)
<b>LUNCH</b> <b>(Shawna)</b>	12:10 – 01:10 PM (60 min)	<b>Working Lunch and d3lab Poster Session</b> <ul style="list-style-type: none"> <li>• Poster Session</li> <li>• Brief 1-on-1 meetings*</li> </ul>
<b>MODULE 5</b> <b>(Billie)</b>	01:10– 02:10 PM (60 min)	<b>Advanced Topics in SMART Design and Data Analysis, Part I</b> <ul style="list-style-type: none"> <li>• Methods for comparing adaptive interventions on a longitudinal outcome</li> <li>• Sample size and statistical power considerations</li> </ul>
<b>BREAK</b>	02:10 – 02:20 PM (10 min)	<b>Break</b>
<b>FROM THE EXPERT</b>	02:20 – 03:10 PM (50 min)	<b>SMART Case Study: Cohesive Multi-tiered Integration of Behavior Support</b> <ul style="list-style-type: none"> <li>• Student to introduce speaker (5 min)</li> <li>• Principal Investigator: <b>Dr. Gregory Roberts</b> (45 min)</li> </ul>
<b>DESIGN PRACTICUM</b> <b>(Billie)</b>	03:10 – 04:25 PM (75 min)	<b>Individual / Group Practicum*</b> <ul style="list-style-type: none"> <li>• Continue to refine experimental designs for adaptive interventions based on Day 3 case studies (45 min)</li> <li>• Groups share their study design for discussion and feedback (30 min)</li> </ul>
<b>CLOSING</b> <b>(Danny)</b>	04:25 – 05:00 PM (35 min)	<b>Day 3 Wrap-Up, 1-on-1 Meetings, and Homework Assignment</b> <ul style="list-style-type: none"> <li>• Homework: <ul style="list-style-type: none"> <li>◦ Refine individual study design</li> <li>◦ Refine/finalize description of your primary aim comparisons</li> <li>◦ Refine/finalize primary aim data analysis plan</li> <li>◦ Sketch of secondary aim comparisons</li> <li>◦ Sketch of secondary aim data analysis plan</li> <li>◦ Continue to think about concerns a reviewer might raise <ul style="list-style-type: none"> <li>▪ Sketch how you will address the concern(s) proactively?</li> </ul> </li> </ul> </li> <li>• Brief 1-on-1 meetings*</li> <li>• Day 3 evaluation</li> </ul>

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## Day 4 -- Thursday, March 14, 2019

Session	Time	Topic
<b>NETWORK</b>	8:30 – 9:00 AM (30 min)	<b>Network over morning refreshments: bagels, fruit, coffee, tea</b>
<b>INTRO</b> <b>(Stephanie)</b>	09:00 – 09:20 AM (20 min)	<b>Review Today’s Agenda, Homework Assignment and Questions from Day 3 Material</b>
<b>MODULE 6</b> <b>(Shawna, Nick)</b>	09:20 – 10:50 AM (90 min)	<b>SMART Secondary Aim Data Analyses</b> <ul style="list-style-type: none"> <li>• Build a more deeply-tailored adaptive intervention <ul style="list-style-type: none"> <li>○ Moderators analysis</li> <li>○ Q-learning Regression</li> </ul> </li> <li>• SAS code and worked examples</li> <li>• Illustrate methods using <b>William Pelham’s</b> IES-funded SMART in ADHD</li> <li>• Practice data analysis</li> </ul>
<b>BREAK</b>	10:50 – 11:00 AM (10 min)	<b>Break</b>
<b>MODULE 7</b> <b>(Danny)</b>	11:00 – 12:00 PM (60 min)	<b>Advanced Topics in SMART Design and Data Analysis, Part II</b> <ul style="list-style-type: none"> <li>• Sample size and statistical power considerations for comparing embedded adaptive interventions in a cluster-randomized SMART</li> <li>• Pilot SMART studies</li> <li>• Seemingly-restricted SMART Designs</li> <li>• Business-as-usual control conditions in a SMART</li> </ul>
<b>LUNCH</b> <b>(Ahnalee)</b>	12:00 – 01:00 PM (60 min)	<b>Working Lunch</b> <ul style="list-style-type: none"> <li>• Individual/group discussion: <ul style="list-style-type: none"> <li>○ Review your aims and study design</li> <li>○ Consider incorporating secondary aims</li> </ul> </li> <li>• Brief 1-on-1 meetings*</li> </ul>
<b>FROM THE EXPERT</b>	01:00 – 01:50 PM (50 min)	<b>SMART Case Study: Pilot SMART for Adolescent Depression</b> <ul style="list-style-type: none"> <li>• Student to introduce speaker (5 min)</li> <li>• Principal Investigator: <b>Dr. Gunlicks-Stoessel</b> (45 min)</li> </ul>
<b>BREAK</b>	01:50 – 02:00 PM (10 min)	<b>Break</b>
<b>DESIGN PRACTICUM</b> <b>(Billie)</b>	02:00 – 02:45 PM (45 min)	<b>Individual/Group Practicum*</b> <ul style="list-style-type: none"> <li>• Sketch the design of a pilot study to inform a larger-scale trial</li> </ul>
<b>CLOSING</b> <b>(Danny)</b>	02:45 – 03:45 PM (60 min)	<b>Day 4 Wrap-Up and Final Discussion</b> <ul style="list-style-type: none"> <li>• Remaining groups to share their study design for discussion and feedback</li> <li>• Final Q&amp;A</li> <li>• Methodological challenges and advances</li> <li>• Provide details for next stage of training <ul style="list-style-type: none"> <li>○ Follow-up video-conference between scholar’s team and a content expert or instructor</li> </ul> </li> <li>• Day 4 evaluation</li> </ul>

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