



มหาวิทยาลัยมหิดล
มิ่งขวัญแผ่นดิน

Planning educational research

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Research questions

- What are the learning outcomes from your idea?
 - Cognitive domain
 - Affective domain
 - Psychomotor domain
- Does it yield more generic outcomes?
- Would you like to measure the attitude/perception towards your innovation/intervention?
- Should the questions be quantitative or qualitative or both?



Research question example

- Learning outcomes of supply chain game
 - Supply chain activities and loyalty
 - Price competition across supply chains
 - Bullwhip effect
- Research questions
 - What aspects of SCM concepts and relations among different modules of a supply chain do students gain through gameplay?
 - What are the students' perceptions toward the developed game?



Activity 5: Research questions

- Select an idea from Activity 2 or 4
- What are the outcomes from your idea?
 - Specific outcomes
 - Generic outcomes (if any)
- Form research questions
 - Quantitative
 - Qualitative
 - Affective part



Research design

- What research design can answer research questions?
 - Impossible to conduct a true experimental educational research
- Who will be the participants?
- Do you need a control group?
 - What intervention will they receive?
 - Is the intervention comparable to the experimental group?
- Should there be a pretest?
 - Do participants have partial knowledge before intervention?



Research design example

- Research questions
 - What aspects of SCM concepts and relations among different modules of a supply chain do students gain through gameplay?
 - What are the students' perceptions toward the developed game?
- Do the RQs mention a control group?
- Convenience sampling, 1 group
- Third-year students in 2 sessions, each playing 2 rounds
- Do we expect students to have partial knowledge?



Activity 6: Research design

- Select research questions from Activity 5
- How many groups do the questions imply?
- Who will be the participants?
- When will the data be collected (pre/during/post intervention)?
- Form research design



Research instruments

- What data are needed to answer research questions?
- What instruments provide the required data?
- Validity
 - Index of Item-Objective Congruence (IIOC)
 - Factor analysis
 - Triangulation
- Reliability
 - Cronbach's alpha
 - Multiple raters



Triangulation

- More than 1 (can be only 2)
- Methodological triangulation
 - Different data collection methods / instruments
- Data triangulation
 - Different places (schools/universities/countries) / times
- Investigator triangulation
 - Different researchers interpret the same data
- Theoretical triangulation
 - Interpret data under different theories



Research instruments example

- What aspects of SCM concepts do students gain through gameplay?
- Convenience sampling, 1 group, during and post intervention
- Instruments
 - Spreadsheets containing all strategic decisions
 - Open-ended questions covering
 - Inventory, sales forecast, cost of lost sales, profit and loss, price competition
 - The topics appeared in the post-test, questionnaire, and interview



Activity 7: Research instruments

- Select a research question from Activity 5
- How many groups do the questions imply?
- Are the data generated during intervention helpful in answering the questions?
- When will you collect data (pre/during/post intervention)?
- What instruments are suitable?
- Compose some items in the main research instrument



Participants

- Who will be your participants?
 - Students, professionals, etc.
 - Inclusion/exclusion criteria
- Are they representative samples?
- How many do you need / can you get?
- When and where do you implement your intervention?
 - Which semester? What time?



Special considerations

- Is there any ethical protocol to follow?
- Is it fair for the control group not to receive the intervention?
- Does your research interfere with their regular schedules?
- What unexpected events may happen during your research?
- Can there be any technical/technological difficulties?
- Have you allocated enough time to collect data?
- What can affect the data that you collect?