28th January 2020

CSCM39/CSDM001: Human Computer Interaction

Dr Siyuan Liu

Department of Computer Science

Office Hour: Thursday 2-4pm

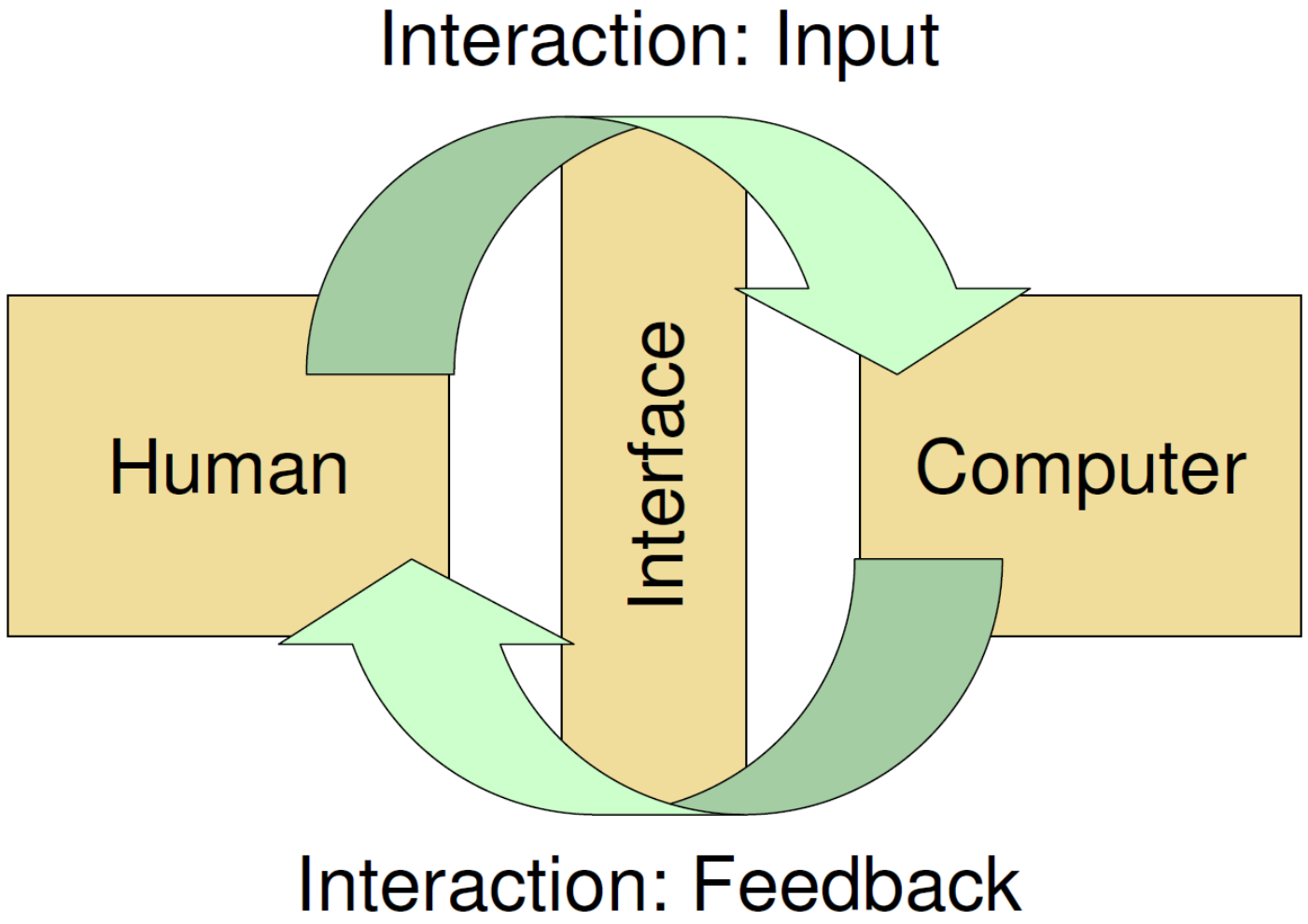
siyuan.liu@swansea.ac.uk

Have you learned HCI previosly?

A brief history of HCI

- 1982-The first conference on HCI (which later became the CHI conference
- 1980-The first book on HCI (Software Psychology)
- Other similar work was going on in the late 1970s, often under “office automation” or “human factors”
- The first computer mouse was publicly demoed in 1968
- Since 1980s, computers were moving out of the research lab, becoming smaller and being used in homes, schools, workplaces, and by non-technical people, creating the need for HCI.

What is HCI?



Human

- Users, single, group working together, etc.
- His/her mind: User tries to complete a task

Computer

- Not just desktop computers
- Any technology: super computer, tablet, phone, etc.

Interaction

- Between two parties
- Communication, direct/indirect

What is HCI?

- Human-Computer Interaction is a ***discipline*** concerned with
  - Design,
  - Evaluation, and
  - Implementation

  of *interactive computer systems* for
  - *human use*, and
  - with the study of the *major phenomena* surrounding them

What do you want to learn from this module?

What will you learn from the module?

- HCI research topics: computer science, engineering, sociology, psychology, anthropology, philosophy, ethnography, linguistics, neuroscience, design, etc.
- Research methods in HCI
  - Quantitative
  - Qualitative
- Presenting your research results
  - Conferences
  - Presentations and papers

Module Assessment

- Oral presentation (20%):
  - Give a 10-15 minute presentation on an HCI topic of your choice
  - The schedule will be released after the selection of topics
- Group Blog (40%):
  - Reflect at least 2 peers' presentations
  - Submission: 11:59pm May 5th, 2020
- Conference/Journal paper (40%):
  - Write a paper on the topic of your choice in SIGCHI format.
  - Submission : 11am May 5th, 2020

Module Timetable (provisional & subject to change)

Week commencing	Tuesdays @10am (1 hour)	Tuesdays @12pm (2 hours)
27 Jan 2020	Module Introduction	HCI Topics, coursework guidelines
03 Feb 2020	Quantitative methods	
10 Feb 2020	Qualitative methods	
17 Feb 2020	Analysing qualitative data	Automated data collection, measure the human
24 Feb 2020	Usability and usability testing	Present research results
02 Mar 2020	Presentation	Presentation
09 Mar 2020	Presentation	Presentation
16 Mar 2020	Presentation	Presentation
23 Mar 2020	Presentation	Presentation
30 Mar 2020	Presentation	Presentation Coursework 1 deadline
27 Apr 2020	QA for coursework 2&3	
04 May 2020	Coursework 2&3 deadline	

Why learn for this module?

HCI IS EVERYWHERE

- Anything else?
- How many interface you used daily? Or today?

Why learn for this module?

- Research is everywhere
  - Researchers
  - Carry out a piece of research as part of a course of study, whether for an undergraduate or post-graduate degree
  - Part of a job/a voluntary role
    - Questionnaires to discover customers preferences
    - Market research to establish whether a new product will sell
    - Focus groups to discuss sensitive issues

Types of Research Contributions

- Empirical contributions: data and analysis
- Artifact contributions: the design and development of new artifacts
- Methodological contributions: new approaches that influence processes
- Theoretical contributions: concepts and models
- Dataset contributions: a corpus for the benefit of the research community
- Survey contributions: a review and synthesis of work done in a specific area
- Opinion contributions: writings which seek to persuade the readers to change their minds

The majority of HCI research is empirical and/or artifact contribution. We will focus on the research methods for the two contributions.

Changes in topics of HCI research over time

- 1980s-office automation software, basic interaction research, basic GUIs
- 1990s-advanced GUIs, user-centered design methods, Internet/Web, computer-mediated communication
- 2000s- user-generated content, user diversity, mobile computing, multimedia
- 2010s-collaboration, mobile/embedded computing, crowdsourcing, emotional and persuasive computing, natural user interfaces, sustainability, big data, accessibility

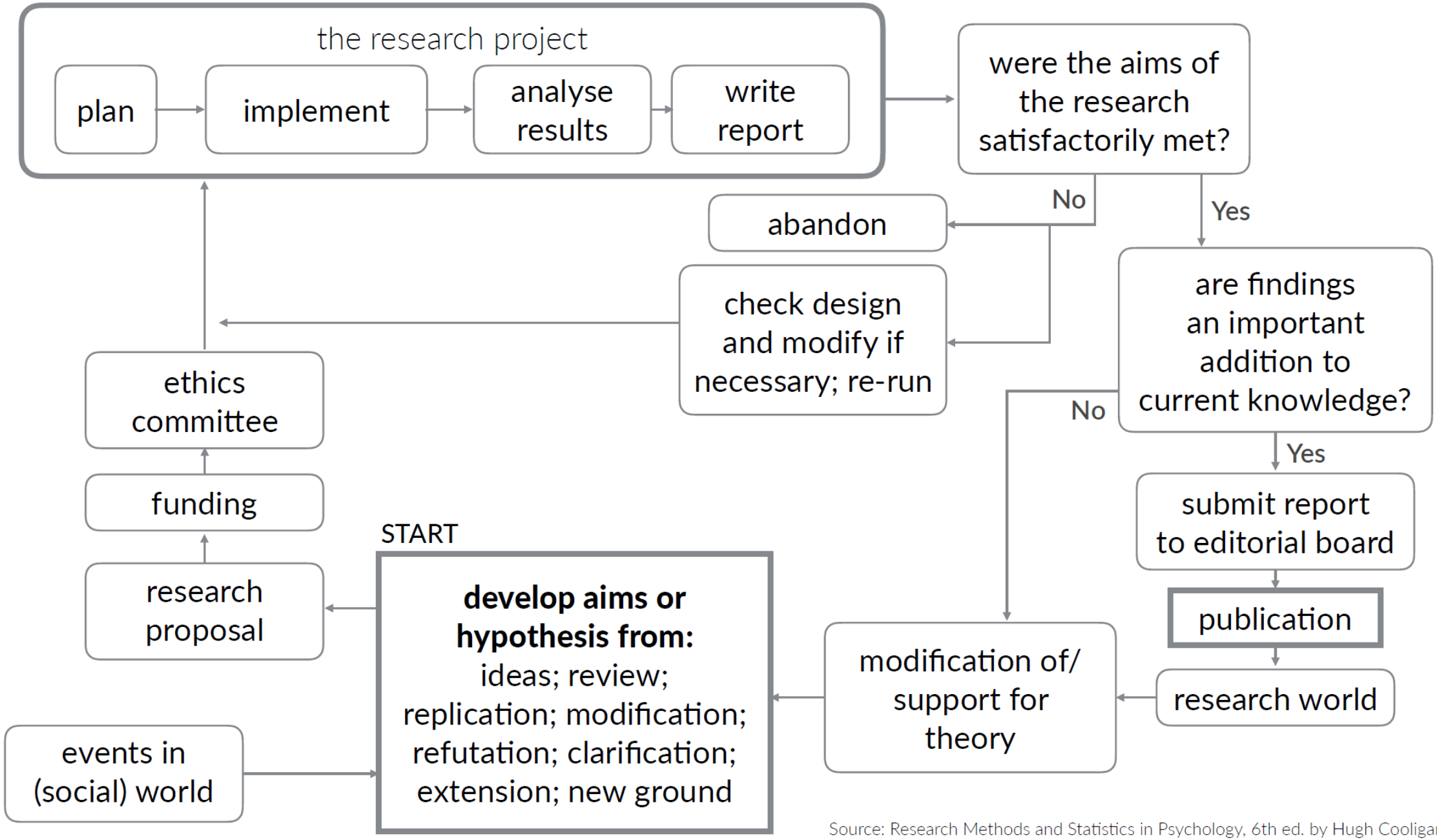
Changes in HCI research methods over time

- New tools or tools where the costs have dropped dramatically
  - Eye-tracking, sensors, drones, facial EMG, EEG, Mechanical Turk
- New approaches
  - Social networking, big data, crowdsourcing, personal health tracking, citation analysis, text parsing

The nature of interdisciplinary research in HCI

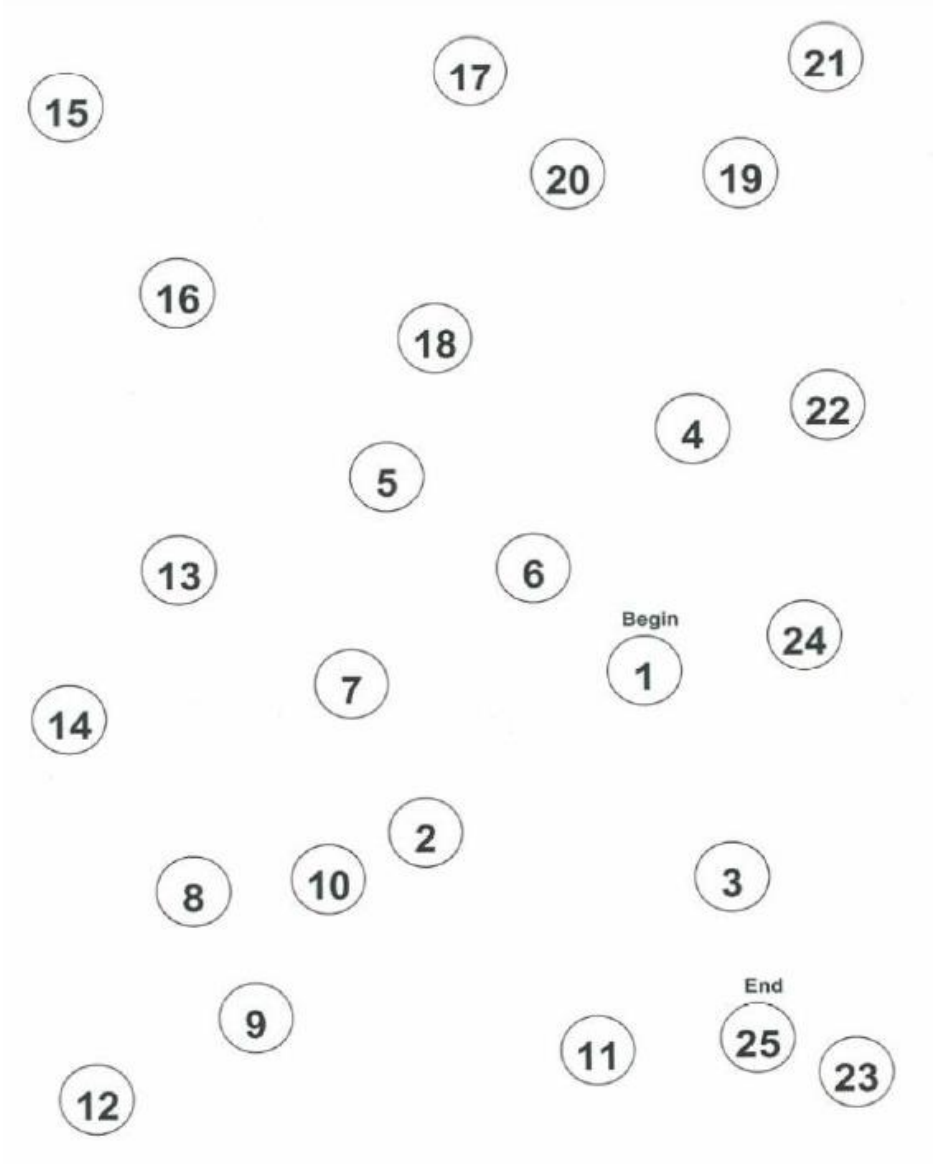
- Computer science: modelling, specifying & analyzing interaction
- Psychology: user as perceiver, thinker
- Software engineering: interaction design is part of overall system
- Linguistics and philosophy: interaction as communicative and conceptual activity
- Artificial intelligence: interactive systems exhibiting or simulating intelligent behavior
- Sociology and anthropology: interaction as social activity

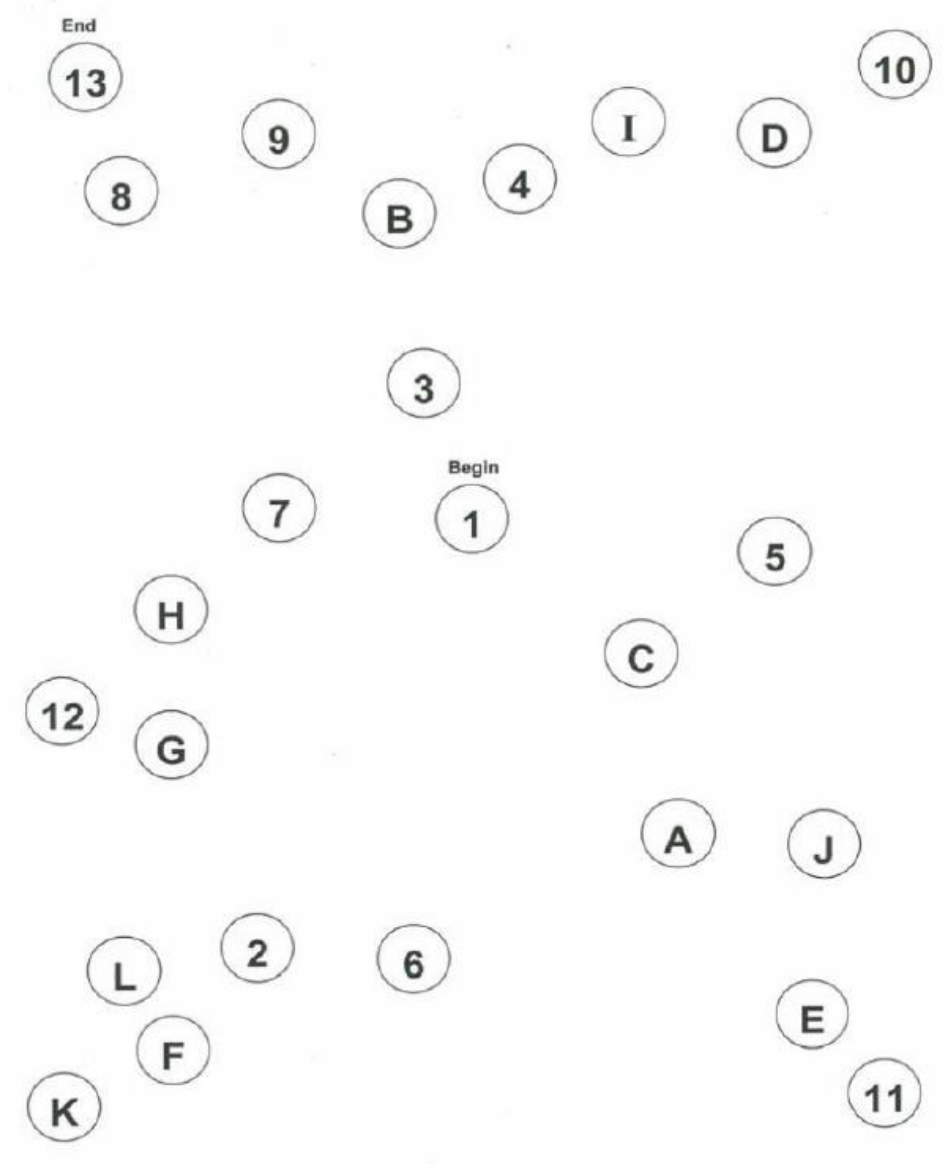
THE RESEARCH LIFE CYCLE



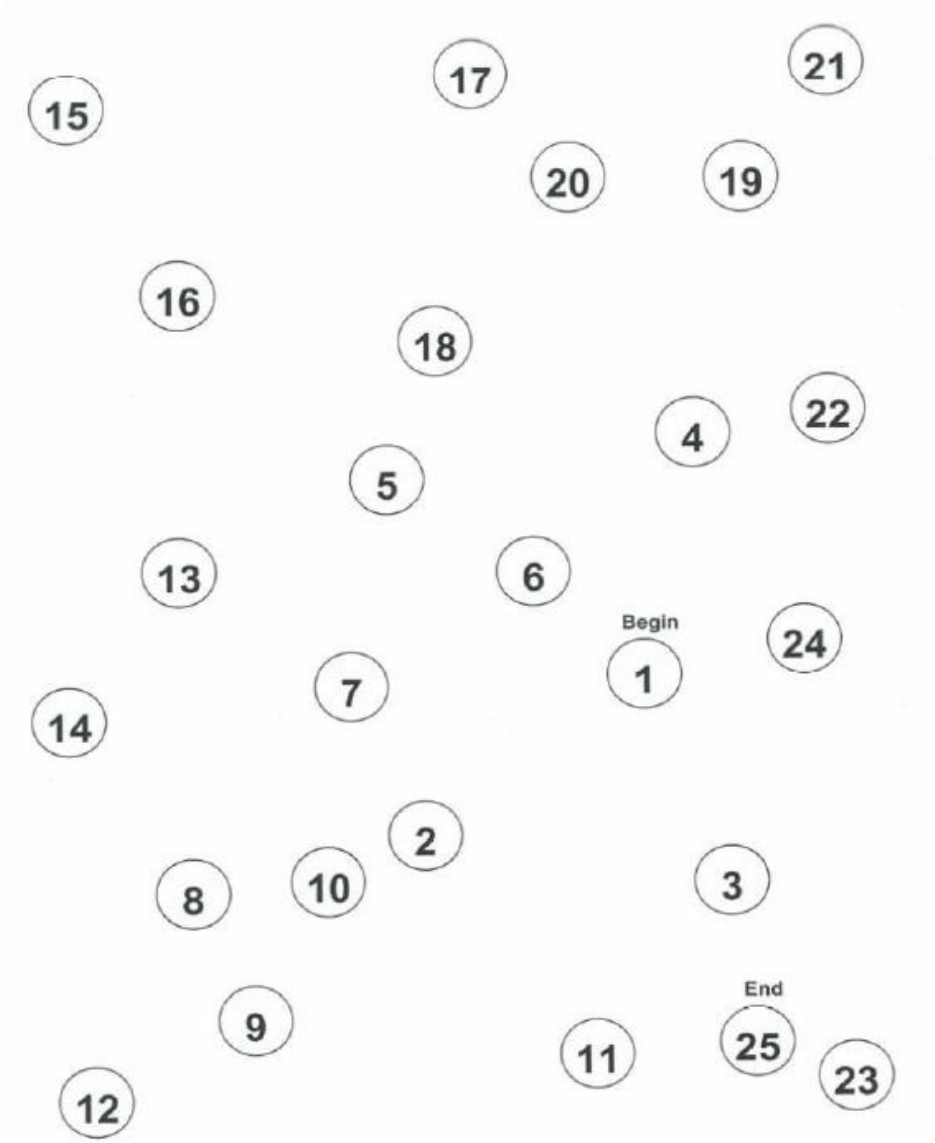
Source: Research Methods and Statistics in Psychology, 6th ed. by Hugh Cooligan

Example

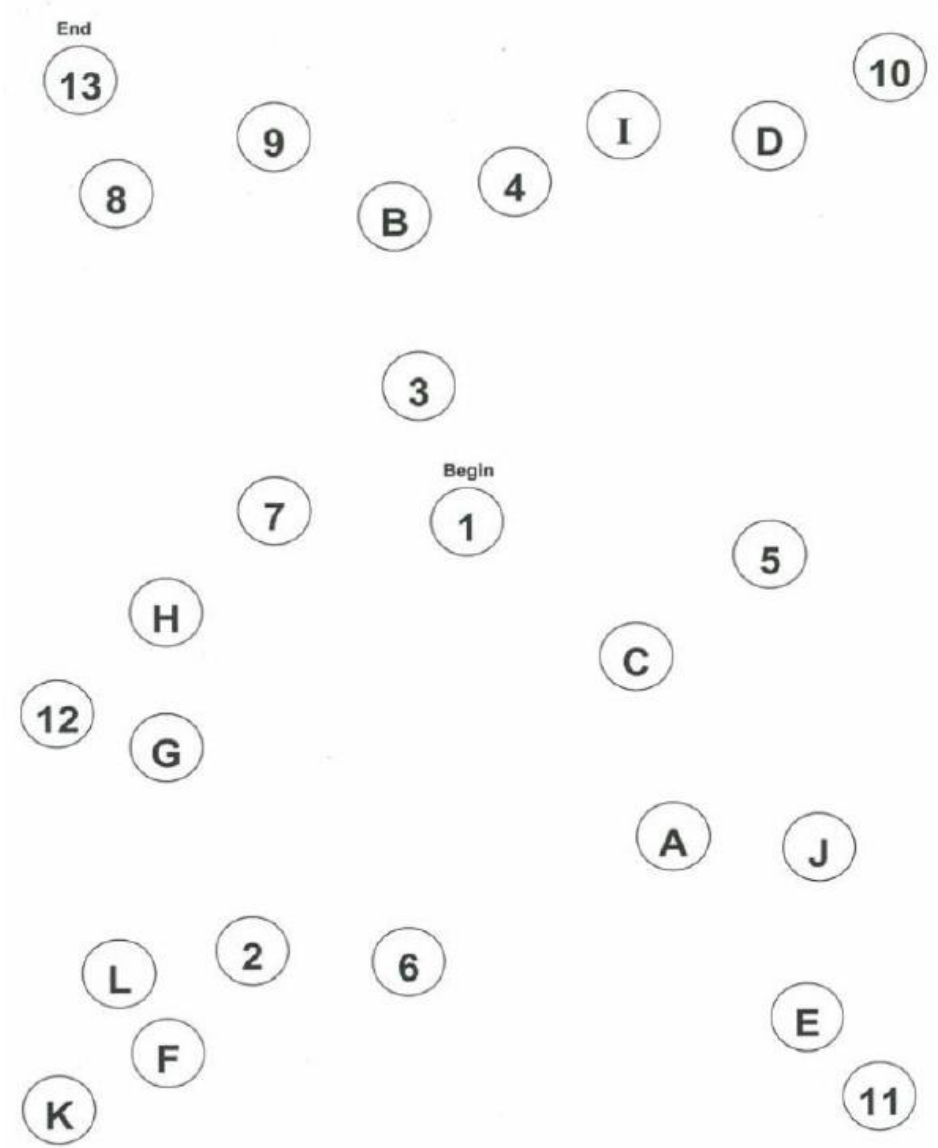

15
17
21
20
19
16
18
4
22
5
13
6
Begin
24
1
7
14
2
8
10
3
End
9
11
25
23
12


End
13
10
9
I
D
8
4
B
3
Begin
7
1
5
H
C
12
G
A
J
2
6
L
E
F
11
K

Trail making test part A



Trail making test part B



We are going to develop a pad-based TMT. Will it achieve the same purpose as the traditional one?

How are we going to conduct research

- What research methods are we going to use?
- How to measure the performance?
- What data are we going to collect?
- How can ensure enough data are collected?
- Any design issues to consider?
- Will there be a learning effect?

……