Writing a Research Paper

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Presentation Structure

- Why write a research paper?
- Structure of a research paper
- Abstract
- Introduction
- Previous work (Literature Review)
- Proposed Solution
- Evaluation Results – Procedure, Methodology, Participants
- Discussion
- Conclusion/Future Directions
- References
- General writing tips

Why write a research paper?

- Publish your results
- Publish in an area that allows you to share your ideas with like minded researchers
- Make an original contribution to the body of knowledge in an area that interests you
- Obtain useful feedback by peer reviewers
- Improve your paper
- Types of paper – conference, journal, book chapter.

Structure of a Research Paper

- Structure basically remains the same whether it is an Honours dissertation, Masters dissertation, PhD dissertation, conference paper or journal paper.

Structure of a Research Paper

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Abstract

- A summary of the entire paper
- Should set the scene and mention:
  - Problem
  - Solution
  - Results
  - Conclusion
- In business papers the abstract is sometime called the executive summary

Introduction

- State the purpose of the research paper in more detail
- Outline the problem in more detail
- Explain structure and sections of the research paper and provide reader with an overview of what to expect next

Previous Work (Literature Review)

- A literature review is a "*critical analysis of a segment of a published body of knowledge through summary, classification, and comparison of prior research studies, reviews of literature, and theoretical articles*" .(Wisconsin) Do not confuse a literature review with an annotated bibliography
- http://uwp.duke.edu/wstudio/resources/genres/lit_review.pdf
- Identify a gap in the academic literature
- Provide the theoretical underpinning for your research
- Prove that you understand the literature

Previous Work (Literature Review)

- Find what interests you – realistic and sustains your engagement
- Go with your strengths
- Find an appropriate group of search terms and categorise all identified papers
- Misconceptions about literature reviews
  - Just because you take the first 100 hits from an electronic database doesn't necessarily mean you've found everything. Refine your methods
  - Just because something is published doesn't mean it's brilliant – be critical

Previous Work (Literature Review) - Sources

- Books
- Electronic Journals; eg.
  - ACM, IEEE, ScienceDirect, Blackwell Synergy, EBSCO (consisting of Psychology and Behavioural Science, PsycINFO, SocINDEX, Library, Information Science and Technology Abstracts, CINAHL), ERIC, IngentaConnect, Infortrac (Expanded Academic ASAP) and Emerald
- Google Scholar
- ResearchGate
- Conference proceedings
- Check the authors are credible in the field

Previous Work (Literature Review) - Example

- Looking for empirical evidence to support the use of GBL in CS/IS/SE.
- ("computer games" OR "video games" OR "serious games" OR "simulation games" OR "games-based learning" OR "MMOG" OR "MMORPG" OR "MUD" OR "online games") AND (education OR learning).
- To restrict a LR impose a sensible time limit.
- 3,500 papers returned – only 24 were relevant to the primary research criteria.

Previous Work (Literature Review) - Discussion

- Content integration
- Assessment integration
- Evaluation
- HCI
- Adaptivity/personalisation
- Aspects of technology

Proposed Solution

- Example from an honours project:
  - Development of an Entity Relationship Editor and Schema Generator
- Example of a masters project:
  - Development of a Constructivist Learning Environment to teach Database Design
- Example for a research paper
  - Generation of empirical evidence in the field of GBL focusing on motivations
- For Serious Games
  - Development of a game to teach some aspect of Software Project Management

Evaluation Results

- Evaluation can be quantitative/qualitative or both
- Participants
- Methodology – Evaluation Framework/Experimental Design
- Procedure
- Results
  - How are the results analysed?
  - Mean, Standard Deviation, Parametric and Non-parametric statistical tests

Discussion

- Interpret the results beyond the objective scope of the results section
- Discuss the results and draw together the main points
- Draw comparisons between what you've found and previous studies
- Highlight points that you feel are interesting
- Discuss limitations of the research

Conclusions – Future Directions

- Formulating the main findings of the research paper into a cohesive whole
- Highlighting what you've found out during the study
- Making it clear how you intend to proceed in the research
- Acknowledge what future work is required

References

- Very important to cite your sources using an appropriate referencing format
- Generally Harvard format
- USE GOOGLE SCHOLAR

References

- **Authored book:**
  - Author, A. A. (1994). *Title of work*. Location/City, State: Publisher.
- **Edited book:**
  - Zhao, F. (Ed.). (2006). *Maximize business profits through e-partnerships*. Hershey, PA: IRM Press.
- **Chapter in an edited book:**
  - Jaques, P. A., & Viccari, R. M. (2006). Considering students' emotions in computer-mediated learning environments. In Z. Ma (Ed.), *Web-based intelligent e-learning systems: Technologies and applications* (pp. 122-138). Hershey, PA: Information Science Publishing.

References

- **Instance of publication in press:**
  - Junho, S. (in press). Roadmap for e-commerce standardization in Korea. *International Journal of IT Standards and Standardization Research.*
- **Journal article:**
  - Sawyer, S., & Tapia, A. (2005). The sociotechnical nature of mobile computing work: Evidence from a study of policing in the United States. *International Journal of Technology and Human Interaction, 1*(3), 1-14.
- **Unpublished doctoral dissertation or master's theses:**
  - Wilfley, D. (1989). *Interpersonal analyses of bulimia: Normal-weight and obese.* Unpublished doctoral dissertation, University of Missouri, Columbia.

References

- **Paper presented at … :**
  - Lanktree, C., & Briere, J. (1991, January). *Early data on the Trauma Symptom Checklist for Children (TSC-C).* Paper presented at the meeting of the American Professional Society on the Abuse of Children, San Diego, CA.
- **Published proceedings:**
  - Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln: University of Nebraska Press.
- **Web site:**
  - VandenBos, G., Knapp, S., & Doe, J. (2001). Role of reference elements in the selection of resources by psychology undergraduates. *Journal of Bibliographic Research, 5,* 117-123. Retrieved October 13, 2001, from http://jbr.org/articles.html

References – Citing in the body of the research paper

- Direct quotes or definitions
  - Laurillard (2002) defines a computer simulation as an "*artefact that embodies some model of an aspect of the real world, allows the user to make inputs to the model, runs the model and displays the results.*"
- Backing up a statement
  - There is a dearth of empirical evidence in the GBL literature (Connolly, 2007; de Freitas, 2006)
- When there are more than 5 names use *et al.* in the body of the paper.
  - *Antiphising Phil (Sheng et al., 2007).*

References – Citing in the body of the research paper

- Putting a statement into your own words
  - Connolly, Stansfield, McLellan, Ramsay and Sutherland (2004) suggest that computer games build on theories of motivation, constructivism, situated learning, cognitive apprenticeship, problem-based learning, and learning by doing.

Referencing – General Tips

- Try not to give too much recognition to one source
- Try to limit your use of quotes and explain things in your own words
- Try to make sure that all of the references cited in the body of the text are in your reference section and vice versa
- Try to make sure that your references are as complete as possible
- Use full names in the reference section

General writing tips

- Don't use a term unless you know what it means
  - For example 'anchored learning'
- Write objectively without taking a controversial stance
  - For example 'software engineering has a bad reputation'
- Write concisely and accurately
- Try not to use words to lengthen the text such as "in order"
- Do not use slang such as "we're", "don't", "shouldn't" etc.
- Don't use the first person in a research paper – you can use:
  - "We discuss…" or make it non-personal "The paper discusses…"