



The structure of the Diploma Thesis

Week 11

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Source material

- ▶ The following source was used for this presentation:
 - ▶ Γιαννής, Γ. 2010. *Οδηγίες για την Ετοιμασία της Διπλωματικής Εργασίας*. Αθήνα: ΕΜΠ.
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The aim of the Diploma Thesis

- ▶ To put into practice what you've learnt during your studies.
 - ▶ To learn how to formulate your research aim and your research question(s).
 - ▶ To become familiar with how to search for relevant sources and how to synthesise information from these sources.
 - ▶ To become familiar with how to place your study within a wider research field, which is going to prepare you for further research.
 - ▶ To understand and practise the stages of research through doing practical work.
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Types of Diploma Theses

- ▶ In your Thesis, you may do one of the following:
 - ▶ Literature review: this means a critical review of current research in a particular field.
 - ▶ Research topic: this involves critical presentation of experimental results of other researchers, and/or results of your own research.
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Analysis and then synthesis

- ▶ Generally, in your Diploma Thesis, you will need to:
 - ▶ Analyse information:
 - ▶ Process all the necessary material to understand your topic.
 - ▶ Synthesise material:
 - ▶ Apply suitable methodologies to find relevant results.
 - ▶ During analysis you will need to formulate your exact research questions(s)/problem(s).
 - ▶ During the synthesis stage you are going to propose ways to address those questions/problems.
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The eight stages

- ▶ The eight stages that make up the work on your Diploma Thesis are:
 - ▶ Analysis:
 1. Finding relevant material
 2. Literature review
 3. Specifying the topic and aims of the Thesis
 4. Selecting a suitable methodology
 - ▶ Synthesis:
 5. Applying the methodology
 6. Finding relevant results
 7. Writing up the Thesis
 8. Presenting the Thesis
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Literature review

- ▶ This is the first and one of the most important stages, in that it will allow you to:
 - ▶ Define the aim of your Thesis more precisely and accurately.
 - ▶ Identify a suitable methodology to address your research questions(s).
 - ▶ Given that the methodology you are going to adopt will depend on the findings of your literature review, this work needs to begin right away and constitutes a very important stage in your research process.
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Aim of the literature review

- ▶ **A twofold aim:**
 - ▶ Identifying relevant studies for systematic review.
 - ▶ Identifying and evaluating relevant methodologies that have been employed both in Greece and abroad.
 - ▶ **To do that, you will need to:**
 - ▶ Search for relevant material.
 - ▶ Retrieve that material.
 - ▶ Synthesise relevant material.
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Sources for the literature review

- ▶ To find relevant material, that is, material suitable for the topic of the Thesis, you will need to search in:
 - ▶ Relevant books.
 - ▶ Other Diploma Theses.
 - ▶ Ph.D. theses.
 - ▶ Research journals.
 - ▶ Conference proceedings.
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Keywords

- ▶ To search in online databases you will need to use relevant keywords.
 - ▶ To find out possible keywords to use in your search, you can:
 - ▶ Locate relevant research papers and see what keywords they have selected to describe the content of their paper.
 - ▶ Make a list of all possible keywords and use them in your search.
 - ▶ In research papers, keywords are placed below the abstract.
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Research databases in engineering

- ▶ To find peer-reviewed articles, you can search databases such as:
 - ▶ American Chemical Society Publications
 - ▶ ASME digital collection
 - ▶ IEEE Xplore - IEEE/IEE electronic library online
 - ▶ ScienceDirect.
 - ▶ For a complete list, see here:
 - ▶ http://lib.ntua.gr/?page_id=70
 - ▶ <https://www.lib.washington.edu/engineering/resources/englibdb>
 - ▶ Your supervisor will guide you towards more specific databases and publications that are relevant to your research topic.
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Structure 1

- ▶ In general, a literature review may include the following:
 - ▶ The topic of the Thesis which provides the context for the review.
 - ▶ A grouping of research studies according to common denominators, such as theoretical framework, qualitative vs. quantitative approaches, conclusions of authors, and so on.
 - ▶ A summary of the contribution of the selected studies, keeping in mind the focus of the Thesis topic.
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Structure 2

- ▶ In general, a literature review may include the following:
 - ▶ An evaluation of methodological flaws or research gaps and/or inconsistencies in theory and findings of the selected studies.
 - ▶ A conclusion which provides an insight into the significance of the Thesis topic and the reviewed body of literature and/or a summary of the methodology and findings of the research.
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Thesis evaluation 1

- ▶ The following criteria are generally used to evaluate and mark your Diploma Thesis.
 - ▶ However, do keep in mind that these may differ depending on School:
 - ▶ The extent to which you have researched current studies in your area of study (i.e. your literature review).
 - ▶ The relevance and accuracy of data (from lab experiments, field data, or results of theoretical calculations).
 - ▶ Accuracy in: evaluating your results, processing data, compiling a mathematical model or proposing applications to specific areas.
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Thesis evaluation 2

- ▶ The following criteria are generally used to evaluate and mark your Diploma Thesis.
 - ▶ However, do keep in mind that these may differ depending on School:
 - ▶ The structure of the Thesis and specifically:
 - ▶ Coherence and cohesion of the text
 - ▶ Correct use of terminology and appropriate language.
 - ▶ Precise wording of the concepts.
 - ▶ Academically correct documentation of conclusions, and so on.
 - ▶ The originality of the Thesis.
 - ▶ The oral presentation of the Thesis.
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Typical structure of a Diploma Thesis 1

- ▶ **1. Title page.**
 - ▶ **2. Acknowledgments.**
 - ▶ **3. Abstract and keywords (in Greek and in English).**
 - ▶ **4. Contents.**
 - ▶ **5. List of Figures.**
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Typical structure of a Diploma Thesis 2

- ▶ **Main body of the text:**
 - ▶ **1. Introduction** (~ 5-10 pages)
 - ▶ - Overview of the research field.
 - ▶ - Aims of the research.
 - ▶ - Methodology.
 - ▶ - Structure of the Diploma Thesis.
 - ▶ **2. Literature Review** (~ 8-12 pages)
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Typical structure of a Diploma Thesis 3

- ▶ **3. Theoretical Background** (~ 8-12 pages)
 - ▶ **4. Methodology - Results** (~25-35 pages)
 - ▶ **5. Conclusions** (~ 4-8 pages)
 - ▶ Summary of main conclusions.
 - ▶ Proposals.
 - ▶ Limitations of the research / Further research areas.
 - ▶ **References** (~ 15-50 references)
 - ▶ **Appendices** (~ 5-40 pages)
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Acknowledgements

- ▶ After the title page, it is customary to thank everyone who has helped and supported you during the research and writing process.
 - ▶ This includes both professional and personal acknowledgements.
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Chapter 1: Aim of the Thesis

- ▶ The aim of the Thesis is usually very similar to the title of the Thesis.
 - ▶ What is also presented here:
 - ▶ Specific objectives related to the general aim of the Thesis.
 - ▶ A brief reference is also made to the importance of the main aim of the research.
 - ▶ The terms used in the title are often repeated in all the chapters of the Thesis.
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Chapter 1: Methodology

- ▶ The methodology briefly presents the main research stages with particular emphasis on data collection and the selected methodology.
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Chapter 1: Structure of the Thesis

- ▶ This outlines the structure of the Thesis with a brief reference to the content of each chapter, thus facilitating the reader to understand the flow of the text.
 - ▶ The description of each Chapter should not exceed one paragraph.
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Chapter 2: Literature review

- ▶ This chapter includes a review of relevant studies and methodologies.
 - ▶ It provides a summary (1 - 3 paragraphs) of each study in question focusing on research framework, methodology and key results with emphasis on data relevant to the topic of the Thesis.
 - ▶ At the end of this chapter, the main points from all studies examined in the review are presented with the aim of showing the importance of the Thesis and justifying the selected methodology.
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Chapter 3: Theoretical background

- ▶ This chapter gives a general overview of the field to which the methodology selected for the current research belongs.
 - ▶ Moreover, different elements of the methodology are explained.
 - ▶ The mathematical and statistical theories on which the selected methodology is based are presented.
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Chapter 4: Methodology – Results 1

- ▶ This chapter includes a detailed description of the application of the methodology and a presentation of the main results of the research.
 - ▶ Depending on the particular structure of the Thesis, this chapter may contain a number of sub chapters.
 - ▶ **More specifically:**
 - ▶ The steps followed for the application of the methodology and the process of obtaining the results.
 - ▶ Particular emphasis is placed on possible statistical methods for checking the reliability of the results.
 - ▶ It is also useful to mention cases that did not lead to reliable results, without offering a detailed analysis.
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Chapter 4: Methodology – Results 2

- ▶ The presentation of the results concerns three phases, that should be clearly distinguished:
 - ▶ a) Presentation of data.
 - ▶ b) Description of results.
 - ▶ c) Explanation of results.
 - ▶ The presentation of data concerns a detailed presentation of data extracted from the application of the selected methodology (columns and table rows, units of measurement, period and reference area, etc.).
 - ▶ The description and explanation of the results concern description and explanation of the most interesting and/or original results in relation to the aim of the Thesis (selected elements of tables, diagrams, etc.).
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Chapter 5: Conclusions

- ▶ This is one of the most important chapters of the Thesis in that it constitutes a synthesis of the most original conclusions and suggestions that ensue from the specific research.
 - ▶ This chapter usually includes:
 - ▶ Summary of main conclusions.
 - ▶ Overall conclusions.
 - ▶ Proposals.
 - ▶ Limitations of the research / Further research areas
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Chapter 5: Summary of main conclusions

- ▶ It begins with restating the aim and the methodology followed in the current study.
 - ▶ It includes a brief overview of the main results presented in the relevant chapters.
 - ▶ If possible, it is useful to summarise these results in a table.
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Chapter 5: Overall conclusions

- ▶ It concerns a synthesis of the most original and useful conclusions drawn from all research stages.
 - ▶ Here, reference should be made to:
 - ▶ The importance and usefulness of the main results of Thesis.
 - ▶ The reliability of the methodology used.
 - ▶ The application of the results to other areas.
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Results and conclusions

- ▶ Both results and conclusions are directly related to the research questions raised at the beginning of the research.
 - ▶ The differences between results and conclusions are:
 - ▶ Results are specific and quantified data and interpretations that are directly related to individual research questions.
 - ▶ Conclusions - as opposed to results - contain information on the usefulness of the results and the methodology used and constitute a synthesis of several elements from the Thesis (including information from the literature review) as well as individual results that attempt to provide an answer to the main research question(s) of the Thesis.
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Chapter 5: Proposals – Further research

- ▶ In the Proposals, reference is made to fields where the results of the Thesis could be applied.
 - ▶ The suggestions for further research concern:
 - ▶ Limitations of the current research.
 - ▶ Areas for further investigation, either by other methods, or by examination of additional characteristics and other parameters.
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References – Appendices

- ▶ A list of sources that were used in the Thesis.
 - ▶ It is important to choose a specific style guide and be consistent with it throughout the text.
 - ▶ The Appendices present useful material (Tables, Charts, Figures, Photos, etc.), which were used or produced and not included in the main body of the text due to their large volume.
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