Learning to learn

Getting the Most out of Your University

Becoming

A Successful Learner &
A Preferred Graduate

Department of
Mechanical Engineering
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Based on original materials developed by Learning to Learn Project, The Hong Kong Polytechnic University
About the “Learning to Learn” Study Guide Series

This study guide for students is developed as a deliverable of the project “Learning to Learn: Developing Students’ Cognitive, Motivational and Interpersonal Strategies for Learning” which is an institution-wide project of The Hong Kong Polytechnic University, with funding from the University Grants Committee’s competitive Teaching and Learning Development Grant. The Project, commenced in September 1999, has an overall aim to help students learn to learn and develop abilities for life-long learning.

The “Learning to Learn” Study Guide Series:

• Getting the most out of your university
• For the success of your study
• Working your way through a group project

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Silent Lam for his support in the production.

Finally, we wish to gratefully acknowledge the University Grants Committee for the funds that made this Project possible.
What will you find inside this booklet?

‘This booklet is for Year 1 PolyU students like you and me.’

‘Do you know what PolyU professors expect you to become?’

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Getting the Most out of Your University

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   Lectures .................................................. Page 16
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1

Becoming a Successful Learner at PolyU

‘What did you usually do in secondary school?’

‘Usually, the teachers taught us, and then we did some exercises. Anyway, the teachers always told us the correct answers.’

‘Oh! You depended too much on your teachers!’

‘At PolyU, you are expected to be much more **ACTIVE** (活躍) and **INDEPENDENT** (獨立) in learning.’

You are expected to do all of these.
Can you do them well?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes, I can.</th>
<th>No, I need to improve.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read a lot of references (參考書) independently (獨立地).</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Learn materials that are not covered in class on your own.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Raise questions actively (活躍地).</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Apply what is learned to solve real-life and complicated problems.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Learn collaboratively (互助地) with others in a group.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Take initiative (自發性) in and responsibility for your own study.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Organise your own study to meet deadlines.</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

‘Oh! I need to find out how to learn at PolyU!’

‘Don’t worry! You will find many tips on how to learn beginning with page 7 of this booklet. However, before you go there, you may also want to find out what is a **PREFERRED GRADUATE** (首選畢業生).’

Turn to the next page...
2
Becoming a Preferred Graduate in
Mechanical Engineering

Preferred Graduate Checklist + Reflective Note
= Your Story of Becoming a Preferred Graduate

Your Story of Becoming a Preferred Graduate
Monitoring your development and reflecting on your experience help you become better. The checklists and templates in this document are specially designed to help you monitor and reflect on your status as a preferred graduate.

How?
1. Use the preferred graduate checklist to check your status as a preferred graduate at regular intervals (e.g. every year / semester)
2. Reflect – the guidelines in the reflection templates will help you – and write down your reflections, thoughts, ideas, plans...

Write your story,
Live your story!
Preferred Graduate Checklist

**What is a Preferred Graduate in Mechanical Engineering?** See table below.

**Why are the qualities of a Preferred Graduate important?** Read the first column carefully.

<table>
<thead>
<tr>
<th>Nature of the Mechanical Engineering discipline</th>
<th>Qualities of the Preferred Graduates in the discipline</th>
<th>How far am I from being a Preferred Graduate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical engineering is about improving the performance of different machines such as car engines, household appliances, industrial machines, jet engines, etc. One must understand that this field is general and involves many different areas.</td>
<td>Understand mathematics and engineering concepts in general</td>
<td>A   B   C   D   E</td>
</tr>
<tr>
<td>Because the mechanical engineering field contains many areas, a mechanical engineer cannot specialise in all of them. Instead, he or she must know about the whole field and specialise only in a few areas.</td>
<td>Have specialised knowledge in chosen areas of engineering</td>
<td>A   B   C   D   E</td>
</tr>
<tr>
<td>Factors such as cost, comfort, safety, environmental concerns, etc. are as important as the technical (技術上) issues in machine design and analysis.</td>
<td>Have general knowledge of economics, social, human and environmental sciences, etc.</td>
<td>A   B   C   D   E</td>
</tr>
<tr>
<td>Calculations are important in mechanical engineering, but the physical interpretation (解 释) of numerical results (數字 答 案) are even more important.</td>
<td>Able to explain the meaning of numerical results</td>
<td>A   B   C   D   E</td>
</tr>
</tbody>
</table>

*Continued on the next page...*
<table>
<thead>
<tr>
<th>Nature of the Mechanical Engineering discipline</th>
<th>Qualities of the Preferred Graduates in the discipline</th>
<th>How far am I from being a Preferred Graduate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>When doing a job, mechanical engineers often work as a team. Therefore, they must have strong communication and teamwork skills.</td>
<td>Have strong communication and interpersonal skills</td>
<td>A B C D E 5</td>
</tr>
<tr>
<td>Ability to be a team player</td>
<td>A B C D E 6</td>
<td></td>
</tr>
<tr>
<td>Since a team must have leaders, mechanical engineers have strong leadership skills.</td>
<td>Able to be a leader</td>
<td>A B C D E 7</td>
</tr>
<tr>
<td>In mechanical engineering, for every problem there are usually several possible solutions. To get the best result, it is necessary to first consider all possible solutions before deciding on the best one.</td>
<td>Open-minded</td>
<td>A B C D E 8</td>
</tr>
<tr>
<td>Have critical thinking and analytical skills</td>
<td>A B C D E 9</td>
<td></td>
</tr>
<tr>
<td>Have problem solving skills</td>
<td>A B C D E 10</td>
<td></td>
</tr>
<tr>
<td>Mechanical engineering often involves creatively applying an old technology to a new situation to produce new results.</td>
<td>Creative</td>
<td>A B C D E 11</td>
</tr>
<tr>
<td>Since the mechanical engineering field changes everyday, mechanical engineers must learn through a lifetime. They are committed in continuous professional development (CPD).</td>
<td>Have independent and life-long learning skills</td>
<td>A B C D E 12</td>
</tr>
<tr>
<td>A mechanical engineer understands the direction the world is going towards and tries to lead that direction.</td>
<td>Have a global view (掌握國際趨勢)</td>
<td>A B C D E 13</td>
</tr>
<tr>
<td>Mechanical engineers must observe the ethical standards of the profession. They also weigh fairly the limitations of the products and technologies that are developed.</td>
<td>Be responsible for the actions taken</td>
<td>A B C D E 14</td>
</tr>
<tr>
<td>Able to see both the positive and negative sides of everything</td>
<td>A B C D E 15</td>
<td></td>
</tr>
</tbody>
</table>

*Turn to the next page...*
Your first time... with the preferred graduate checklist

Now that you have completed the preferred graduate checklist for the first time, what have you learnt about your discipline? What have you learnt about yourself as a future professional in that discipline? How prepared are you? What do you need to work on? How…

1) Assess your status as a preferred graduate by completing the preferred graduate checklist.
2) Write on next page your reflections and plans regarding your development as a preferred graduate.
Is being a professional in your field like what you have expected?
What qualities do you need? What qualities do you have?
How do you plan to develop the qualities you need?
One year has gone... How far have you gone?

It has been some times since you last completed a preferred graduate checklist, how far have you progressed since then? What qualities have you developed or need to develop? What new goals will you set for the coming year?

1) Assess your status as a preferred graduate by completing the preferred graduate checklist.
2) Write on next page your reflections and plans regarding your development as a preferred graduate.
My Reflections...

Today is __________

- Have you achieved the goals that you set last time?
- Are the strategies that you have used to develop relevant qualities effective?
- What do you need to work further on?
The time is coming closer... Let's give it the finishing touch

You are now only one year from your becoming a professional, how far left do you have to go? What steps do you need to take to get there (in terms of competence rather than qualification)? What would be your focuses this year?

1) Assess your status as a preferred graduate by completing the preferred graduate checklist.
2) Write on next page your reflections and plans regarding your development as a preferred graduate.
My Reflections...

Today is __________

- What qualities remained to be developed?
- What learning difficulties have you encountered? How could they be overcome?
- How would you plan this year in relation to your career development?
Finale... Are you ready?

At last, you are here, up on a hill looking at the prospect that lies in front of you, seeing all the challenges and opportunities. After all these years, what have you learnt about yourself? Are you ready?

1) Assess your status as a preferred graduate by completing the preferred graduate checklist.
2) Write on next page your reflections and plans regarding your development as a preferred graduate.
My Reflections...

Today is __________

- What do you know about your strengths and weaknesses?
- How well do you know yourself as a learner, a professional, and a person?
- What will you bring with you from your university life into your working life?
In this section, you will learn about the nature of and how to get the Most out of the learning opportunities at PolyU. Keep in mind that you may encounter some of these opportunities now and other opportunities in the future. Make sure you come back to the following pages when you encounter the opportunities in the future.

the Lectures (Page 16)
the Tutorials (Page 17)
the Practical Classes (Page 18)
the Fieldwork (Page 19)
the Projects (Page 20)
the Presentations (Page 21)
the Group Work (Page 22)
the Assignments (Page 23)
What is a lecture?
- In a lecture, you get important knowledge.

Activity
*Have a look at the diagram below...*
Each suggested action (small bullet points in 3 rectangular boxes) helps you attain one or more learning goals (big bullet points in the middle big circle) – Can you see how they are related? Draw a line to link them up!

**SUGGESTED ACTIONS**
*Before a lecture...*
- Read about the next lecture topic.
- Write down some questions about the topic you’ve just read.

**SUGGESTED ACTIONS**
*During a lecture...*
- Pay attention to what your professor discusses.
- Think about the points presented by your professor. DON’T just copy notes.
- Raise questions when appropriate during the lecture

**SUGGESTED ACTIONS**
*After a lecture...*
- Review your notes and mark down some questions about:
  - Concepts you do not understand;
  - Topics you want to know more about which are not covered in the lecture.
- Read up on some references that will supplement the lecture.

**Some LEARNING GOALS of a lecture:**
- Get knowledge.
- Get a deeper understanding by thinking and questioning.
- Get motivated to get involved in the class.

Where to go from here?
1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?
What is a tutorial?
- The purposes of tutorials are for you to **develop deep understanding** of the topics introduced in lectures and to **apply the knowledge to solve problems**

**Activity**

*Have a look at the diagram below…*

Each **suggested action** (small bullet points in 3 rectangular boxes) helps you attain one or more **learning goals** (big bullet points in the middle big circle) – Can you see how they are related? **Draw a line to link them up!**

**SUGGESTED ACTIONS**

*Before a tutorial…*

- Prepare some questions about:
  - Concepts you do not understand;
  - Topics you want to know more about but not covered in lectures.
- Complete the preparatory work assigned by your tutors.

**SUGGESTED ACTIONS**

*During a tutorial…*

- Take initiative to raise questions.
- **Actively** participate in learning activities.
- Try to think deeply.
- Discuss **actively** with your tutors and classmates.

**SUGGESTED ACTIONS**

*After a tutorial…*

- Try to apply what is learned to solve problems

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**Where to go from here?**

1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?
3c
Getting the Most out of the Practical Classes

What is a practical class?
There are two important aspects of practical classes:
- For many subjects, ‘doing’ is an important part of the knowledge. You learn about the ‘doing’ part in practical class.
- In practical classes you have to apply the theories in practical situations.

Activity
Have a look at the diagram below...
Each suggested action (small bullet points in 3 rectangular boxes) helps you attain one or more learning goals (big bullet points in the middle big circle) – Can you see how they are related? Draw a line to link them up!

SUGGESTED ACTIONS
Before a practical class...
- Understand the objectives of the practical work
- Relate the practical work to the concepts introduced in lectures.
- Read related materials, such as the guide for the practical work, background theories, etc.

Some LEARNING GOALS:
- Deepen understanding of theories by seeing how they really work in a practical situation.
- Develop practical skills for the profession, for example, skills in observation, collecting and handling real data.
- Gain experience with the real things in practice, for example equipment, samples, real clients, etc.
- Learn to think and analyse.
- Learn to observe carefully and critically

SUGGESTED ACTIONS
During a practical class...
- Play an active role in doing the work and applying the concepts.
- Work together with your classmates, question each other and share ideas and references
- Observe carefully and jot down what happens

SUGGESTED ACTIONS
After a practical class...
- Think about what/how you learned and see what/how to improve yourself in the future.
- When you write a report:
  - Analyse the data/information collected for meanings;
  - Relate the results to existing theories and argue for your interpretation;
  - Discuss the errors/uncertainties in depth and comment on the limitation of the practical work;
  - Make recommendations for improving the practical work based on observation and evaluation.

Where to go from here?
1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?


What is fieldwork?

- In fieldwork, you do a real job on your own in the real world. The ‘field’ for fieldwork may be a factory for engineering students, a clinic for health science students, a social welfare organisation for social work students or a foreign country for language students.

Activity

Have a look at the diagram below...

Each suggested action (small bullet points in 3 rectangular boxes) helps you attain one or more learning goals (big bullet points in the middle big circle) – Can you see how they are related? Draw a line to link them up!

Some LEARNING GOALS of fieldwork:

- **Understand** the work context of the real world.
- Develop your abilities to **apply knowledge** to solve real world problems.
- Develop your **abilities in handling real-life problems**.
- Learn to work with others effectively.
- Develop yourself as an independent lifelong learner.

SUGGESTED ACTIONS

**Before the fieldwork…**

- Revise the topics related to the fieldwork.
- Draw up a fieldwork learning plan to plan out:
  - How to apply your knowledge in the field;
  - How to learn from the real-world experience.

**During the fieldwork…**

- Observe carefully and critically how things happen in the real work situation.
- Actively and creatively solve problems and make decisions in the field.
- Keep a learning journal.

**After the fieldwork…**

- Look back at your experience from the field and think about:
  - The important things you learn;
  - What you may do to improve your practice in the future;
  - How the fieldwork has helped you deepen your understanding of related theories.

Where to go from here?

1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?
What are projects?
- Projects are usually open-ended, much like a real research. You may be asked to find your own problem, design your own method to solve the problem, carry out your study and write your own report independently. Many projects are group projects.

Activity
Have a look at the diagram below...
Each suggested action (small bullet points in 3 rectangular boxes) helps you attain one or more learning goals (big bullet points in the middle big circle) – Can you see how they are related? Draw a line to link them up!

SUGGESTED ACTIONS
Before a project…
- Understand the expectation of your professor for the project such as the focus, the size, the coverage, the depth, etc.
- Form a group which can work together effectively.

Some LEARNING GOALS:
- Deepen your understanding as you look into a specific topic in depth for a period of time.
- Get specialized knowledge of a topic while you are doing research on it.
- Develop your abilities to solve real-life problems.
- Learn to work with others in a group effectively.
- Develop your leadership skills through group work.
- Develop yourself to become an independent lifelong learner.

SUGGESTED ACTIONS
During a project…
- Creatively and critically apply your knowledge from different subjects to solve a problem.
- Make use of a lot of resources, e.g. references, people who have expertise in your topic, etc.
- Make a schedule and monitor your progress.
- Participate actively in your group and be willing to take up leadership responsibilities.
- Refer to How to work effectively in a group project.

SUGGESTED ACTIONS
After a project…
- Reflect on your experience in the project and think about:
  - What you have learned about handling complicated real-life problems;
  - What you have learned about teamwork

Where to go from here?
1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?
3f Getting the Most out of the Presentation

What is a presentation?
- University students are often asked to do presentations after some independent studies, such as a project. Professionals in the real world are often involved in presentations too. In a presentation, you have to explain a topic to your teacher and classmates.

Activity
Have a look at the diagram below...
Each suggested action (small bullet points in 3 rectangular boxes) helps you attain one or more learning goals (big bullet points in the middle big circle) – Can you see how they are related? Draw a line to link them up!

Some LEARNING GOALS of a presentation:
- Sharpen your understanding because you must have a good understanding yourself before you can explain the topic clearly.
- Develop your logical mind because a good presentation must be clear and logical.
- Develop your language and communication skills.
- Enhance your self-confidence.

SUGGESTED ACTIONS
Before a presentation...
- Clarify the theme of your presentation.
- Organise the content of your presentation.
- Prepare the presentation materials.
- Be critical about your presentation content. Make sure that it is clear and logical.
- Refer to the section on preparing a presentation in How to work effectively in a group project for detailed help.

SUGGESTED ACTIONS
During a presentation...
- Be confident and try your best to put up a good show.
- Refer to How to work effectively in a group project for advice on presentation skills.
- Try your best to learn from your classmates’ comments about your presentation.

SUGGESTED ACTIONS
After a presentation...
- Use the self-evaluation checklist in How to work effectively in a group project to help you review your performance at the presentation.

Where to go from here?
1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?
What is group work?
- Group work is very common in university. You may be asked to discuss and work in a group during class or form a group to work on a project over a period of time.

Activity
*Have a look at the diagram below…*
Each suggested action (small bullet points in 3 rectangular boxes) helps you attain one or more learning goals (big bullet points in the middle big circle) – Can you see how they are related? Draw a line to link them up!

### Some LEARNING GOALS:
- Make use of the critical discussion to **deepen** your **understanding**.
- Develop your **critical thinking abilities** through interacting with others.
- Develop your **language and communication skills**.
- Enhance your **self-confidence**.
- Learn to **work** with others **in a group** effectively.
- Develop your **leadership skills** through group work.

### SUGGESTED ACTIONS
**Before the group work…**
- Adopt the **correct attitude**:
  - **Commit** yourself to work with others;
  - **Avoid relying on others** to do the work;
  - Prepare yourself by working through *How to work effectively in a group project*.

**During the group work…**
- Be **active** and **creative** in the discussion.
- Be willing to **learn from others**.
- Be **responsible** in completing your share of the work.
- Be willing to take up the role as a **leader**.

**After the group work…**
- Use the self-evaluation checklist in *How to work effectively in a group project* to help you review your group working experience.

Where to go from here?
1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?
Getting the Most out of the Assignments

What are assignments?
- An assignment is a task that you have to work on your own. You may be asked to solve problems, do a case study, write an essay on a topic, etc.
- Learning independently is an important part of professional development and lifelong learning. Assignments provide you with an opportunity for independent learning.

Activity
Have a look at the diagram below...
Each suggested action (small bullet points in 3 rectangular boxes) helps you attain one or more learning goals (big bullet points in the middle big circle) – Can you see how they are related? Draw a line to link them up!

SUGGESTED ACTIONS
Before an assignment…
- Understand the assignment thoroughly.
- Find out the requirements of the assignment, e.g. writing style, layout, method of referencing, word limits, deadline for handing in the assignment, etc.
- Draw up a time schedule to make sure that you can finish the assignment before the deadline.

SUGGESTED ACTIONS
During an assignment…
- Get ideas from different sources such as books, journals, internet websites, and discuss with your classmates and teachers.
- Produce an original answer based on your own understanding.
- Organise your ideas and write down your thoughts to make sure that your answers are logically answering the question.
- Refer to How to get a good answer. It will help you achieve good learning and get a good grade.

SUGGESTED ACTIONS
After an assignment…
- Review your draft to make sure that it answers the question.
- Seek comments from tutors.

Some LEARNING GOALS of assignments:
- Learn how to tackle a problem independently and actively.
- Update yourself with the latest knowledge of a specific area/discipline.
- Improve your analytical power, thinking ability and written presentation techniques.
- Develop your skills in time-management.

Where to go from here?
1. Are there other learning goals?
2. Are there any other possible actions?
3. Which suggested actions will you try first?