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Teacher's Manual
教师用书

Nucleus
新核心

综合学术英语教程
An Integrated Academic English Course

总主编 蔡基刚
主 编 王新博 付 晓

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3

上海交通大學出版社
SHANGHAI JIAO TONG UNIVERSITY PRESS

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An Integrated Academic English Course

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内容提要

本书是《综合学术英语教程3》的教师用书，依据总主编蔡基刚的学术英语教学理念和思路设计，供教师教学和学生自学使用。全书围绕第三册教材中的“定义”、“分类”、“比较”、“因果”、“举例”和“引证”这六大学术阅读和写作中的最基本技能设计课堂活动，以任务或项目为驱动方法编写或组织课堂活动，最大限度地体现原教材的编写理念和力求达到的教学目标。

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总 序

2007年，教育部颁布文件，提出高等院校英语教学改革要探索有效的教学方法和模式，切实提高高等院校学生的专业英语水平和直接使用英语从事科研的能力。2013年2月，上海市教委颁布《上海市大学英语教学参考框架(试行)》。这份我国第一个以学术英语为导向的地方大学英语教学大纲明确规定“大学英语教学的目标是培养学生听、说、读、写等学术英语交流技能，使他们能用英语进行自己的专业学习和从事今后的工作，在自己专业领域具有较强的国际交往能力”。为推动大学英语改革，落实这一新的高校大学英语教学目标，我们组织编写了新核心学术英语（EAP）系列教材。

学术英语属于专门用途英语，“是一种在高校层面为高校学生用英语进行专业学习提供语言支撑的英语教学”，旨在“帮助学生从通用英语顺利过渡到用英语进行专业学习”。学术英语可分通用学术用途英语（EGAP）和专门学术用途英语（ESAP）两种。通用学术英语训练学生在各学科中通用的听、说、读、写等学术英语交流技能，例如听讲座、做笔记、报告展示、撰写文献综述和论文、参加学术讨论等能力，尤其是学术活动中所需要的批判性思维能力。专门学术英语侧重特定学科（如医学、法律、工程等学科）的词汇语法、语篇体裁以及工作场所所需要的英语交流能力。可见，通用学术英语和目前高等院校英语课程内容具有本质区别，专门学术英语和过去的科技英语或目前高校开设的法律英语、计算机英语、生物英语等专业英语也是有根本区别的。专门学术英语强调的是这些学科领域内的口头和书面交流的英语技能；专业英语则把重心放在这些学科的词汇和内容的教学上。前者是大学英语教师开设的，后者往往是学科的专业教师开设的。

新核心学术英语系列教材包括通用学术英语和专门学术英语两个系列。通用学术英语系列包括《综合学术英语教程》系列教材、《学术英语·听说教程》系列教材等。通用学术英语系列教材和目前高等院校综合英语教材有三个不同。不同之处有：① 两者在目的上不同。前者是为学生的专业需求、专业学习服务的；后者纯粹为打好英语基础而打基础。② 课文材料有所不同。前者的课文信息性较强，选用具有一定抽象性的一般

人文科普文章；后者的课文主要是以趣味性较强的小说、故事和散文为主。③ 教学方法不同。前者是以项目为驱动，以学习者为中心的教学，主要训练学生查找信息，归纳和表达，培养学生的批判性思维能力，以及团队合作和交际沟通能力；后者则以教师为中心，注重词汇、语法和句子的分析。

Cummins (1979) 认为，一个人的语言水平由“人际交流基本技能”(Basic Interpersonal Communicative Skills, BICS) 与“认知学术语言能力”(Cognitive/Academic Language Proficiency, CALP) 组成。前者是指日常生活交际中使用的语言，交际任务的认知要求比较低，语言和内容都比较简单；后者则是指在抽象程度较高的学术话题交流中使用的语言，不仅需要有很强的听、说、读、写能力，而且需要有很强的分类、综合、评价和推断的能力，对认知程度要求比较高。当学习者具备了一定的语言水平和知识面，如果还是在低层次的语言技能上徘徊训练，还是选择日常生活主题，其语言能力不可能有进一步提高。也就是说，适度挑战性的学术内容 (appropriately challenging academic content) 和一定深度的认知互动 (sufficient depth of cognitive interaction) 是提高英语水平的关键 (Kong & Hoare, 2011)。

根据我们了解，世界各国、各地区高校的英语教学无不是Academic English。例如，凡是到英美国家和香港地区读大学的外国留学生都必须先修读学术英语，以尽快适应主流专业课程。即使是日本高校这样的非全英语教学环境，他们为非英语专业学生开设的英语课程也清一色是学术英语听说、学术英语读写、学术英语陈述等课程，因为这些课程不仅培养学生专业学习所需要的听、说、读、写能力，而且帮助他们掌握科学的研究方法，组织和评价不同来源的信息，并能用口语和书面方式进行表达，很好地培养了学生的批判性思维能力和创新性思维能力。这些能力已成为当今高校学生不可或缺的最基本的学术素养。

本系列教材是我国高校英语教材从几十年一贯的“打基础性质”的通用英语教材向为满足学生专业学习需求的学术英语教材转型的尝试，开启了高等院校英语教材本质的回归之路，是与世界高校非英语专业学生的英语教材的第一次接轨，以期更好地为学生专业学习需求和专业人才培养总目标服务。尽管国际上已有许多学术英语教材出版，但适应中国学生的本土化高校学术英语系列教材仍是空白。本系列教材的编写是首创，经验不足，错误难免，但其破冰之旅必将对我国高等院校英语教材的转型和发展产生历史性的影响。

主编　蔡基刚

2013年4月

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前 言

《综合学术英语教程》(An Integrated Academic English Course)系列教材是“新核心学术英语(EAP)系列教材”中的主干教材。这套主干教材包括四册,供非英语专业本科四个学期的通用学术英语教学使用,旨在培养学生的听、说、读、写、译等方面的学术英语的基本技能。教材的编写特色如下。

一、基于比较全面的编写调查

本套教材的编写基于以下几个调查。① 对北美高校、日本高校、香港地区高校和宁波诺丁汉大学的学术英语课程内容进行了文献调查或实地考察;② 对我国高校尤其是上海高校的专业院系的教师和学生进行了较大规模的英语学习需求分析;③ 对雅思学术英语考试、托福考试和我国大学英语四、六级考试等英语考试进行了分析;④ 对国外学术英语教材进行分析、研究和借鉴。在此基础上,我们形成本套教材所要教授的学术英语的内容和技能。

二、突出学术英语技能训练

本套教材具有很强的针对性,着重培养学生专业学习中所需要的英语能力,如:① 听懂英语讲座和讲课的听力技能;② 搜索、汲取、评价和组织信息的阅读技能;③ 引用原文、转写原文段落和句子等语言技能;④ 口头陈述学术观点和演示学术研究成果的技能;⑤ 撰写学术说明文、文献综述和小论文等写作技能;⑥ 参加和组织学术讨论,进行有效问答的口语技能;⑦ 以独立或合作形式开展学术研究的技能等。

三、强调课文选材的信息性

与传统的高校英语教材突出趣味性原则和选材以日常话题和“久经考验、百读不厌”的范文为主不同,本套教材充分考虑学生在专业学习和日常工作中英语阅读的需求,以及当代高校学生的知识结构和思维特点,强调课文的信息性和适度的抽象性。本套教材通过选取自然科学和人文社会等针对一般读者的文章,培养学生快速阅读和快速汲取信息的能力,以应对真实世界的英语阅读。同时,通过一些深层次的科技人文话题的介绍,培养学生的科学精神、科学方法和批判性思维的学术素养。

四、培养批判性思维能力

批判性思维能力是21世纪高等院校学生进行卓有成效的专业学习和研究时必备的

学术素养，也是从事任何工作必备的职业素养和公民素养。本套教材通过精心设计的练习，着重培养学生的批判性思维能力。例如，通过向学生提供不同来源的同一主题的课文材料，鼓励学生质疑和比较不同作者的观点，提出独立的、综合的、评判性的见解，以培养学生分析问题，思考和推理，从而解决问题的能力等。在方法上，本套教材采用以项目为驱动的教学法，此教学法可以有效地培养学生的批判性思维能力。

五、注重较大量输入和输出

国外的学术英语读写教材以技能介绍为主，阅读量不大。考虑到我国高校学生的英语语言基础还相对薄弱，本套教材围绕技能学习提供大量的文章（如每单元提供4篇相关主题的文章，和2~3篇讲座性质的听力），以保证语言的大量输入和词汇的附带习得。词汇训练除了大学英语四、六级词汇，还包括国际上通用的3 000词族和28个学科中通用的、词频最高的570个学术英语词族。课文中的这些词族作为目标词被重点学习和操练。写作训练是以话题或项目为驱动，要求在阅读相关文章的基础上进行有引用文献的学术写作，不规定词数。书面输出强调正式文体。在写作基础上要求进行陈述演示性质的宣读。

六、各册采用不同的编写体例

与传统的高校综合英语教材不同，本套教材根据不同的学术英语能力和各个阶段的教学重点，考虑到学生和教师的审美疲劳感，四个分册的编写采用不同的体例，如第一、二册围绕不同话题组织各个单元的内容，第三册以微技能为主线组织各个单元，第四册以输入、输出过程为主线安排各单元。除了教材的主干结构不同，每册的练习更是有很大的不同，练习新颖多样，几乎所有的练习都是模拟真实学术活动，而非模拟考试中的题目。例如，做读书笔记的归纳练习，写文章所需要的综合信息的练习和转写原句的练习等，其中不少练习具有创新性，给老师、学生带来耳目一新的感觉。

七、参与培训学术英语教师

学术英语如何教？对大多数一直从事通用英语教学的教师来说，这是一个崭新的课题。调查表明，我国的高校英语教材比起《教学大纲》或《课程要求》更能起到传播一种新的教学理念、教学模式和教学方法的作用。考虑到我国高校英语教材的这一特殊作用，同时考虑到不少教师对学术英语的不了解甚至恐惧心理，本套教材尝试通过具体的编写体例和练习模式，用比较直观的方法对教师进行培训。

本套教材是中国学术英语教材的第一次尝试，其中定会存在不当和疏漏之处，敬请读者批评指正。

蔡基刚

2013年5月

编写说明

本书是《综合学术英语教程3》的教师用书，本书依据总主编蔡基刚的学术英语教学理念和思路设计，供教师教学和学生自学使用。全书围绕第三册教材中的“定义”、“分类”、“比较”、“因果”、“举例”和“引证”这六大学术阅读和写作中的最基本技能设计课堂活动，以任务或项目为驱动方法编写或组织课堂活动，最大限度地体现原教材的编写理念和力求达到的教学目标。

本书的六个单元内容主题涉及“知识与技术”、“能源与环境”、“食品与卫生”、“医学人文”、“人工智能”、“人口发展”，既相对集中又相互关联。各单元的项目式驱动教学活动也均围绕单元主题展开。每个单元均由以下六大部分构成。

第一部分是授课计划(Lesson Plans)，包括教学目标(Objectives)、学时分配(Time Allotments)、教学步骤(Suggested Teaching Steps)三部分，从宏观角度围绕各项技能布局整个单元的教学任务和要求。其中，教学步骤中的一个重要设计就是围绕该单元的主要内容开展项目驱动式教学活动，需要教师提前安排和分解教学任务，从宏观角度统领整个单元，确保教学目标的实现。

第二部分是课文相关信息解读(Text-related Information)，涵盖背景信息(Background Information)和课文分析(Text Analysis)两部分内容。这部分从较为微观的层面，详细解读各篇章，内容涉及篇章大意、背景知识、语言难点、长难句解读等，期望为教师备课提供尽可能详尽的参考，减轻备课中的重复性劳动。由于教材中文章大多涉及当代科技发展的最新动态，涉及术语和概念较多，备课时部分采用了汉语和英语混合方式，以方便教师理解和掌握。

第三部分是补充课堂活动(Additional Activities)，旨在为教师提供更多灵活多样的课堂教学选择。活动大致分为两大类，一类是长难句翻译练习，以训练学生准确把握上下文，不失真地传递作者的交际信息，可以作为科技翻译技巧的辅助训练，原则上由学生课外完成，教师结合学生翻译情况进行点评。第二类是根据课文篇章设计的一些小型项目驱动式学习活动，与每单元项目驱动活动形成互补。

第四部分Keys to the Exercises是《综合学术英语教程3》的练习参考答案或提示。有些练习属于开放性练习，无标准答案，需由教师依据学生活动情况总结归纳。

第五部分是四篇阅读文章的参考译文(Translations),考虑到科技文本的成篇特点,在翻译过程中,译者遵循刘崇德先生倡导的"信、达、切"的翻译标准,力求准确传递原语篇的语境意义。

本册教师用书在编辑过程中参考了大量的国内或国外网站、报章杂志等的资料和文献,在此无法一一列出,仅对他们表示衷心的感谢和敬意。

由于编者学识水平所限,书中错误或不妥之处在所难免,敬请各位同仁批评指正。

编　者

2014年8月4日

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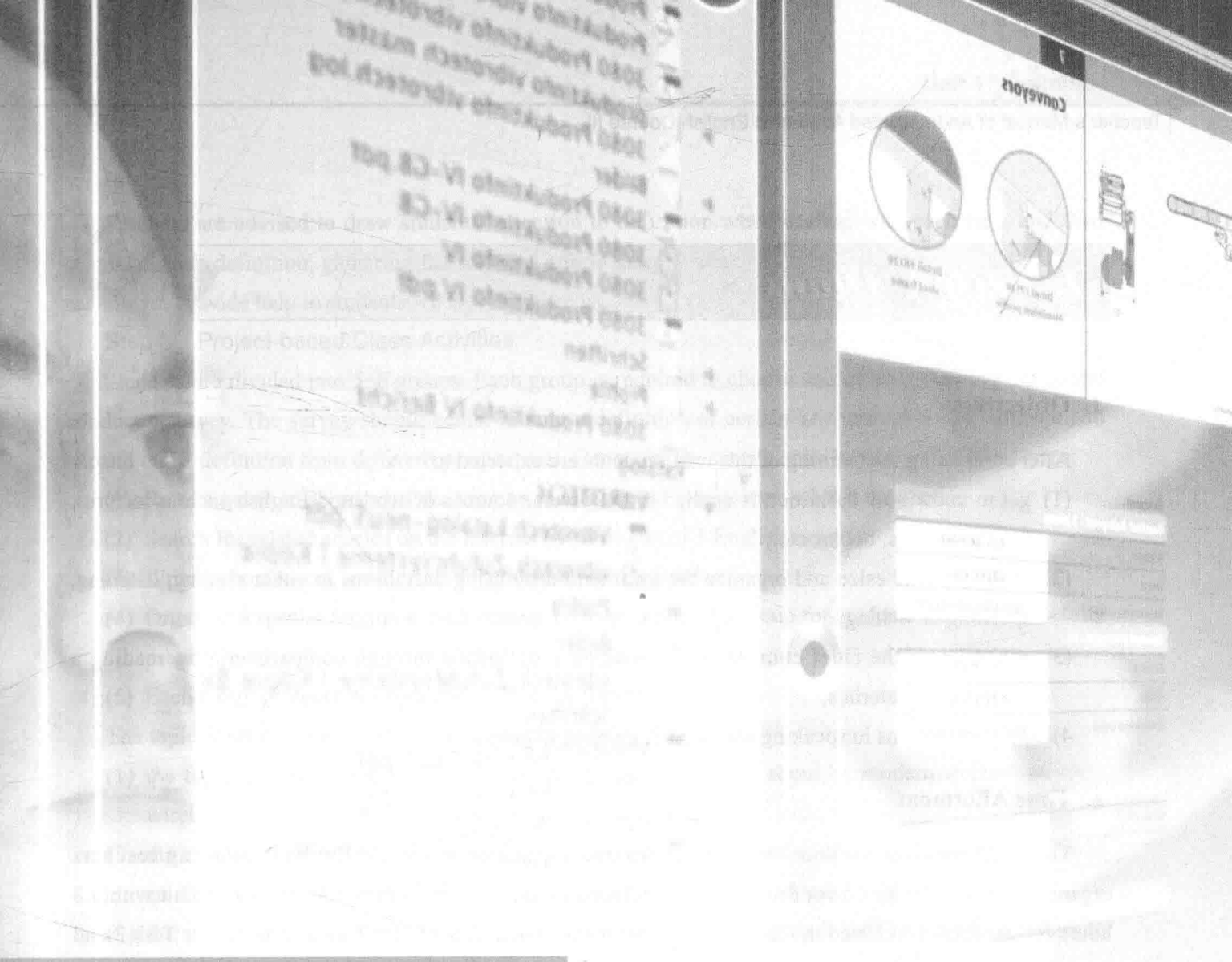
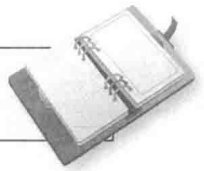


Unit 1

Definition

I. Lesson Plans



1. Objectives

After completing the learning of this unit, students are expected to

(1) get to know how definition is applied in the diverse sources of academic English such as lectures, journal articles, books, etc.;

(2) evaluate, synthesize and organize the information by using definitions in either reading, listening, speaking or writing;

(3) get to know the chief components in making a definition through comparison after reading a diversity of materials;

4) apply definitions in speaking and writing tasks as required.

2. Time Allotment

This unit revolves around how definitions are applied in academic English, entailing teachers organizing class activities from this perspective. Teachers are advised to complete the whole unit within 8 hours for the four tasks listed in the textbook: 1 hour for Task 1, 2 hours for Task 2, 3 hours for Task 3 and 2 hours for Task 4.

3. Suggested Teaching Steps

Step 1 Warm up

Arrange students in pairs and have them brainstorm anything from words, phrases, books, movies or daily usage concerning the following technical terms. Ask students to write down as much information as possible and guide students to think about what is the differentiating point or aspect for each term. Then each pair is advised to use that information to give a definition of it.

(1) artificial intelligence (2) cloud computing (3) biotechnology (4) wireless power

(5) indigenous knowledge (6) ultrasonics (7) disruptive technology (8) phobia

(9) anthropology (10) art installation

Step 2 Tasks 1, 2, 3, 4

Tasks 1, 3, and 4 are four reading passages, all of which are about how to use definitions to develop the central ideas. Reading 1 is a relatively short passage introducing a new topic by using definitions. Readings 2 and 3 are long reading passages for detailed analysis of how definitions are used within authentic contexts. Reading 4 provides a concise and well-organized passage chiefly for writing purposes by using definition. Teachers are advised to employ different teaching strategies and time allotments to handle the materials.

Task 2 is intended for listening practice through the use of definition. Focus should be given to Listening 1 with the other two as supplementary listening.

Teachers are advised to draw students' attention to definition when dealing with each task, and then center on each definition, gathering the relevant information or ideas together for global understanding of each topic. Provide help to students whenever necessary.

Step 3 Project-based Class Activities

Students are divided into 5–6 groups. Each group is required to choose one of the following topics and conduct a survey. The survey should center around a definition of certain key term or a new concept and expand on its definition from different perspectives. Generally the survey consists of the following steps:

(1) Raise a question about what the term or concept is, and brainstorm what it is about;
(2) Search for related articles on the Internet (a minimum of 3 English essays);
(3) Write a short report, synthesizing the ideas from the articles;
(4) Organize a special forum on each term or concept within the group for students themselves to fully present it;
(5) Each group presents its research result in the form of PPT.

The topic areas revolving around a key term or concept are:

(1) the fundamental change in the way we live and work brought about by modern technology (take wireless power and cloud computing as part of the examples);
(2) the adverse impact of modern technology on the existing way of life (take indigenous knowledge as an illustration to demonstrate the great risks ensuing from the development process);
(3) the strategy on how to strike a balance between development and tradition (give more examples to illustrate each point);
(4) the amazing range of benefits modern technology has brought to society (take ultrasonics and other instances to illustrate);
(5) whether modern technology is a blessing or a curse to human life and the environment;
(6) whether technological innovations, especially disruptive technologies, can push human civilization forward.

III. Text-related Information

1. Background Information

Teachers need to be well informed of how definition is applied in an academic English teaching environment as a prerequisite to classroom teaching. Questions like "What is definition in the usual or popular sense? What is definition within the academic context? What kinds of definitions are academically put forth?" should be given ample attention before classroom teaching. The following can serve as some background information.

1) Understand the dictionary meaning

(1) a statement expressing the essential nature of something;

(2) a statement of the meaning of a word or word group or a sign or symbol;

(3) the action or process of stating the meaning of a word or word group;

(4) the action or the power of describing, explaining, or making things or events definite and clear (e.g. the definition of a telescope, her comic genius is beyond definition).

(5) In philosophy, definition means the specification of the meaning of an expression relative to a language.

2) Classifications

Definitions may be classified as **lexical, ostensive,** and **stipulative**. Lexical definition specifies the meaning of an expression by stating it in terms of other expressions whose meaning is assumed to be known (e.g., a ewe is a female sheep). Ostensive definition specifies the meaning of an expression by pointing to examples of things to which the expression applies (e.g., green is the color of grass, limes, lily pads, and emeralds). Stipulative definition assigns a new meaning to an expression (or a meaning to a new expression); the expression defined (definiendum) may either be a new expression that is being introduced into the language for the first time, or an expression that is already current.

An **intensional definition**, also called a coactive definition, specifies the necessary and sufficient conditions for a thing being a member of a specific set. Any definition that attempts to set out the essence of something, such as that by genus and differentia, is an intensional definition.

An **extensional definition**, also called a denotative definition, of a concept or term specifies its extension. It is a list naming every object that is a member of a specific set.

Thus, the "seven deadly sins" can be defined intensionally as those singled out by Pope Gregory I as particularly destructive of the life of grace and charity within a person, thus creating the threat of eternal damnation. An extensional definition would be a list of the seven. In contrast, while an intensional definition of "Prime Minister" might be "the most senior minister of a cabinet in the executive branch of government in a parliamentary system" , an extensional definition is not possible since it is not known who future prime ministers will be.

One important form of the extensional definition is **ostensive definition**. This gives the meaning of a term by pointing, in the case of an individual, to the thing itself, or in the case of a class, to examples of the right kind. So you can explain who Alice (an individual) is by pointing her out to me; or what a rabbit (a class) is by pointing at several and expecting me to "catch on" . The process of ostensive definition itself was critically appraised by Ludwig Wittgenstein.

An **enumerative definition** of a concept or term is an extensional definition that gives an explicit and exhaustive listing of all the objects that fall under the concept or term in question. Enumerative definitions are only possible for finite sets and only practical for relatively small sets.

(from Wikipedia and online dictionary merriam-webster)

3) Synonyms or near synonyms to enhance teachers' expressiveness about "definition"

Synonyms

description, delineation, depiction, picture, portrait, portraiture, portrayal, rendering, sketch

Some related words

account, anecdote, chronicle, narrative, report, story, tale, yarn, demonstration, exemplification, illustration, clarification, elucidation, explanation, explication, exposition

2. Text Analysis

Task 1 Familiarizing Yourself with Definition

Reading 1 Great Leaps in Modern Technology

1) Main Ideas

Reading 1 takes wireless power and cloud computing as examples to illustrate the great leaps in technology in the past few years and the enormous impact on our life and work. Since these two terms may be less familiar to the readers, both illustrations start from its definition to give us a brief depiction of what each innovation is. These two examples convince the readership of the fast-paced technological advancement and the role of definition used in actual context for both acquisition and dissemination of knowledge.

2) Language Points

(1) **wireless power (L1, para.1, p.2)** 无线供电，或称无线能量传输，是一种不经由物理媒介将电力能量从发电装置或供电端转送到电力接收装置的技术。

(2) **electrical load(L1, para.2, p.2)** 用电负荷指电能用户的用电设备在某一时刻向电力系统取用的电功率的总和，称为用电负荷；用电负荷是电力总负荷的主要部分。

(3) **In the latter, the proportion of energy received becomes critical only if it is too low for the signal to be distinguished from the background noise (L4, para.2, p.2)** In this sentence, "the latter" refers contextually to the wireless communications, which indicates the big difference between wireless power and wireless communications.

(4) **cloud computing(L1, para.3, p.2)** Cloud computing in general can be portrayed as a synonym for distributed computing over a network, with the ability to run a program or application on many connected computers at the same time. In common usage, the term "the cloud" is essentially a metaphor for the Internet.

云计算是分布式计算（Distributed Computing）、并行计算（Parallel Computing）、效用计算（Utility Computing）、网络存储（Network Storage Technologies）、虚拟化（Virtualization）、负载均衡（Load Balance）等传统计算机和网络技术发展融合的产物。云计算可以认为包括以下几个层次的服务：基础设施即服务（IaaS）、平台即服务（PaaS）和软件即服务（SaaS）。云是网络、互联网的一种比喻说法。

(5) **In fact, many network diagrams use the image of a cloud to represent the Internet. This symbolizes the Internet's broad reach, while simplifying its complexity (L4–5, para.1, p.3)** Here "simplifying its complexity" means the use of cloud computing can make the whole hard-to-reach system user-friendly and manageable, which otherwise should be much more complicated and complex.

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