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附录A

**文献原文**

摘要：移动革命的时代到了，随着移动设备性能的增强和普及率的提高，移动学习必将会在教育领域发挥越来越大的作用，本文基于大量文献事实，主要介绍了移动学习领域国外的一些研究成果。我国应该借鉴国外的经验，取其精华去其糟粕，找到符合本国国情的特色移动学习方式。

关键词：移动学习;国外;研究成果

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前言：移动学习的背景当今时代是一个移动设备的时代，各式各样的移动设备包括智能手机、掌上电脑、移动媒体播放器、平板电脑、手提电脑随处可见;当今时代又是一个知识时代，信息爆炸，知识膨胀，这就要求人们活到老，学到老，否则就会跟不上时代的步伐。于是，能随身携带的移动设备作为学习的新载体是一种必然的趋势。而且随着高速网络设备的日益增多和无线技术的不断发展，网络接口将随处可见。目前，移动技术正在全球范围内突飞猛进地发展。

一、移动学习的定义

移动学习现在并没有一个很统一的定义，许多学者都基于自己的研究领域给出了不同见解，下面我们罗列一些比较权威的定义，然后在此基础上给出自己的理解。

Clark Quinn认为移动学习是一种通过IA设备实现的数字化学习，这些IA设备包括Palms、Windows CE设备和数字蜂窝电话等。

查不拉和菲格雷多（Thomas Chabra & Jessica Figueiredo）把移动学习定义为任何时间、任何地点甚至通过任何设备都能进行学习的一种方式。

哈里斯（Paul Harris）认为移动学习是移动计算技术和电子学习相结合所产生的随时随地学习的环境。Harris又进一步对此做了解释，他认为移动学习应该能够使学习者通过移动电话或PDA能随时随地享受一个受教育的片段，即“enjoy an educational moment”，并且在这个过程中，往往更多使用的是PDA设备，虽然笔记本电脑被广泛使用，但它并不符合大多数移动学习的定义。

综上所述，我认为，移动学习有广义和狭义两种含义。狭义上，移动学习是指通过联入网络的各种移动设备进行学习的一种方式，如现在比较流行的网易公开课和可汗学院，我们利用智能手机、平板电脑等都可以对需要补充的知识进行学习。广义上，移动学习应该指的是一种随时随地能进行学习的学习环境。在这种环境下，我们有强大的搜索引擎（不一定是互联网搜索引擎）可供我们搜索想要的资源，我们有足够的学习资料可供学习者学习，最终形成一种包罗万象式的移动学习网络。

二、国外移动学习研究

西方发达国家科技领先，技术实力雄厚，当代移动设备大多起源于那里，移动学习的研究也主要集中在这些国家。虽然移动学习起步较晚，但当这一新颖的概念出现在人们的视野中时，立刻就引起了人们极大的热情

与关注，许许多多的专家学者为之钻研，也取得了一系列的研究结果，下面将针对部分做一下介绍。

1.专门为移动设备设计的课程。美国斯坦福大学学习实验室的研究人员探索研究了在语言教学中使用移动电话的潜力。他们利用移动电话的语音和电子邮件功能开发了西班牙语学习课程。这些课程包括词汇练习、小测验、文字和短语翻译，以及与教师的实时对话。研究结果表明，通过移动电话来进行小测验是非常有效的。

卡内基梅隆大学计算机科学学院启动了一个名为Pebbles的掌上电脑项目，其目的是研究如何在课堂上或校园内有效地使用掌上电脑以及配合个人电脑或其他设备的使用。宾尼法尼亚州立大学阿宾顿分校已经在很多课堂上使用掌上电脑，学生们可以使用掌上电脑来做课堂笔记，整理听课内容，进行电子测验。威克弗里斯特大学医学院给每一个2～4年级的学生提供了一部Palm掌上电脑，以便他们随时随地查阅参考资料、查寻电话号码以及记录日志。

2.WAP门户。WAP教育站点的建设是目前移动学习研究领域中的又一重要方面。WAP教育站点与普通WAP站点相比在技术上并没有太大的区别，不同之处在于应用的目的和面向的对象。欧洲的一个重点研究机构Ult

ralab率先将最新技术开发用于教育实践，它通过分析16～24岁的没有受过良好教育的欧洲青年人的学习特征，开发和建立了支持移动学习的WAP教育站点。

由于wap门户研究结果的正面性，在过去的几年里许多大学陆续建立了自己的WAP教育站点，这其中的一些典型例子如：美国的Griffith大学和Minnesota州立大学，加拿大的NAIT等。

3.短信通信服务。短信作为一种通信方式，在移动学习中也能占据一席之地。一些教育机构也尝试着把实时短信应用在教学中。

李维和肯尼迪在2005年开始了一项将短信通信应用到教学中的研究计划。该计划使得澳大利亚的意大利语学习者能够通过手机短信的方式在特定的时间接收意大利语的词汇、成语、定义以及例句。教师可以要求学生参加小测验或回答跟踪问题来了解他们对知识的掌握程度。

英国Kingston大学进行了评价短信息服务应用于教育教学有效性的实验。根据实验需求他们开发了一套短信息服务系统，可用于向学习者发送课程安排、考试安排和考试成绩等信息。实验设计如下：参于实验的学习

者被随机分成五个小组，其中一组通过E-mail获取信息，另一组通过Web查阅信息，剩余的三组通过短信息服务接收信息。通过这次实验发现，相对E-mail和Web，学习者在某些情境下更倾向于获得以SMS作为载体的信息。学习者普遍认为通过SMS接收到的信息更具个性化，同时更方便快捷。

4.终身学习和基于问题的学习。在移动学习领域里最著名的研究项目之一就是英国伯明翰大学的HandLeR研究项目。该项目试图更深入地理解在不同环境下的学习过程并且探讨终身学习的可行性，研究的重点在于如何设计以人为中心的交流系统。研究人员还探讨了其他一些课题，比如概念图表、知识共享、终身学习、可穿戴式学习技术以及移动学习者之间的交流。目前研究小组已经开发出了针对9～11岁儿童使用的移动学习工具，试验效果令人满意。

关于基于解决问题的学习的研究，挪威的奥斯陆大学开展了一个名为Knowmobile的项目。该项目试图在医学教育中使用掌上电脑和智能手机。参与该项目的学生被安排在不同的学习环境里使用不同的移动设备学习。这个研究项目得出的结论是，掌上电脑不仅仅起着个人数字助理的作用，而且为人们铺设了一条能够在这个复杂并且相互关联的社会网络中交流合作的通道。

三、移动学习所面临的问题与挑战

在移动设备的体积越来越小的同时，它的功能却越来越强大。人们已经可以通过移动设备传输学习资料或者访问网络资源。尽管在过去的几年里有很多领域都已部署了移动学习系统，但它未来的发展还面临许多问题和挑战。比如，网络基础设施跟不上移动设备发展的需要。目前的宽带网络还不能有效地传输移动学习资料，无线信号还未能覆盖到很多边远地区。阿特维尔建议把网络在线学习和网上资料下载到移动设备上，以便学生可以在没有网络的地方进行学习。另外，由于还没有完全成熟的网络标准，开发和实施移动教学系统对教育工作者来说还是一个挑战，研发一套可以在任何移动设备上运行的移动教学系统，在目前来说还是比较困难的。现行的解决方案就是教育工作者需要针对不同的移动设备，设计不同版本的教学内容。为了提高移动教学环境灵活性，必须有相应的方案来是同一部分教学内容能够兼容不同的移动设备，或者已经有一套基本的框架能把教学内容根据不同的移动设备自动转化为该设备的内容，这样学生就可以自由地选择使用他们喜欢的移动设备。

四、移动学习的未来展望

在一次访谈中，凡特霍夫特博士这样谈移动学习研究和实践方面的发展趋势：

第一，网络将具有真正的移动性，而不是一个单独运行的移动网络。我们通过各种设备（包括手机）可以获得更多的数字内容和基于Web的应用程序。这将有助于缩小校内和校外数字技术应用的差别。其中，云计算

将变得更为重要，因为它提供了新的、成本低廉的方式进行合作、存储文件和基于Web环境的应用。

第二，将来会有更多的、个性化的网络。用户（包括学生）将越来越多地决定访问的内容和以何种方式获取、建立、定制、汇总和分享数字化信息。对于教育而言，这意味着一刀切的教学模式将不再是主流模式。

第三，移动设备和相关应用将更加精致和多功能化。Web工具会整合多种功能，并且，人机交互的方式将会改变，例如更多地使用触屏、手势、和语音输入等。另外，我们会看到越来越多的数字技术及其所处环境之

间的交互。我们已经拥有这方面的技术，如全球定位系统、智能物体和理标注数据。最后，我们使用的学习工具也会发生许多变化。例如，游戏将成为一个更重要的学习工具。

五、结束语

移动学习已经成为一个必然化的趋势，所以研究者们应该减少喋喋不休的对移动学习的各种诟病，转而专注于对移动学习如何有效地提高学习效率、扩大教育普及率等正向的命题。而且许多教育工作者都对移动学习的潜力持有乐观的态度。瓦格纳深信移动学习代表着科学技术促进教学的未来。当前，国内移动学习方面的研究还是很欠缺的，特别是实证研究，中国拥有全球最多的使用移动设备的入口，所以移动学习更具潜力，未来移动学习的普及需要教育工作者和教学设计者的共同努力，一个爱学习的国家将会强大且伟大，而我对我的祖国充满信心。

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附录B

**文献翻译**

Abstract: The era of the mobile revolution has arrived. With the enhancement of the performance of mobile devices and the improvement of penetration rate, mobile learning will play an increasingly important role in the field of education. Based on a large number of literature facts, this paper mainly introduces the foreign some research results. Our country should learn from foreign experience, take its essence and discard its dross, and find a characteristic mobile learning method that suits its own national conditions.

Key words: mobile learning; foreign countries; research results

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Foreword: Background of mobile learning The current era is an era of mobile devices, and various mobile devices including smartphones, PDAs, mobile media players, tablets, and laptops can be seen everywhere; the current era is also an era of knowledge, The explosion of information and the expansion of knowledge require people to live and learn as they grow old, otherwise they will not be able to keep up with the pace of the times. Therefore, it is an inevitable trend to use mobile devices that can be carried with you as a new carrier for learning. And with the increasing number of high-speed network devices and the continuous development of wireless technology, network interfaces will be everywhere. Currently, mobile technology is advancing by leaps and bounds across the globe.

1. Definition of mobile learning

There is no uniform definition of mobile learning at present, and many scholars have given different opinions based on their own research fields. Below we list some more authoritative definitions, and then give our own understanding on this basis.

Clark Quinn believes that mobile learning is a digital learning through IA devices, which include Palms, Windows CE devices and digital cellular phones.

Chabra & Jessica Figueiredo (Thomas Chabra & Jessica Figueiredo) define mobile learning as a way of learning anytime, anywhere, and even through any device.

Harris (Paul Harris) believes that mobile learning is a learning environment anytime, anywhere produced by the combination of mobile computing technology and e-learning. Harris further explained this. He believes that mobile learning should enable learners to enjoy an educational moment anytime and anywhere through mobile phones or PDAs, that is, "enjoy an educational moment", and in this process, often more PDA devices were used, and while laptops were widely used, they did not fit most definitions of mobile learning.

To sum up, I think that mobile learning has two meanings, broad sense and narrow sense. In a narrow sense, mobile learning refers to a way of learning through various mobile devices connected to the network, such as Netease Open Class and Khan Academy, which are more popular now. We can use smart phones, tablets, etc. to supplement what we need. knowledge to learn. In a broad sense, mobile learning should refer to a learning environment where learning can be done anytime, anywhere. In this environment, we have a powerful search engine (not necessarily an Internet search engine) for us to search for the resources we want, we have enough learning materials for learners to learn, and finally form an all-encompassing mobile learning network.

2. Foreign mobile learning research

Western developed countries are leading in science and technology and have strong technical strength. Most of the contemporary mobile devices originated there, and the research on mobile learning is mainly concentrated in these countries. Although mobile learning started late, when this novel concept appeared in people's field of vision, it immediately aroused people's great enthusiasm

Many experts and scholars have studied it and obtained a series of research results. The following will introduce some of them.

1. Courses specially designed for mobile devices. Researchers at Stanford University's Learning Lab explored the potential of using mobile phones in language teaching. They developed Spanish language learning courses using the voice and email capabilities of mobile phones. The lessons include vocabulary exercises, quizzes, word and phrase translations, and live conversations with teachers. The results of the study show that the quizzes are very effective when administered via mobile phones.

Carnegie Mellon University's School of Computer Science has launched a handheld computer project called Pebbles, which aims to study how to use handheld computers effectively in the classroom or on campus and in conjunction with PCs or other devices. Penn State University Abington has used Pocket PCs in many classrooms. Students can use Pocket PCs to take class notes, organize lecture content, and conduct electronic tests. Wake Forest University School of Medicine provides each 2nd to 4th grade student with a Palm handheld computer, so that they can check reference materials, look up phone numbers and record diaries anytime and anywhere.

2. WAP portal. The construction of WAP education site is another important aspect in the field of mobile learning research. There is not much difference in technology between WAP education sites and ordinary WAP sites, the difference lies in the purpose of the application and the object-oriented. A key research institution in Europe, Ult

Ralab took the lead in applying the latest technology development to educational practice. It developed and established a WAP educational site that supports mobile learning by analyzing the learning characteristics of European youths aged 16 to 24 who have not received a good education.

Due to the positive results of wap portal research, many universities have successively established their own WAP education sites in the past few years, some typical examples of which are: Griffith University and Minnesota State University in the United States, NAIT in Canada, etc.

3. SMS communication service. SMS, as a form of communication, also has its place in mobile learning. Some educational institutions are also trying to apply real-time SMS in teaching.

Levy and Kennedy began a research program in 2005 on the application of text messaging to teaching. The program enables Italian learners in Australia to receive Italian vocabulary, idioms, definitions and example sentences at specific times via text messages. Teachers can ask students to take quizzes or answer follow-up questions to see how well they know.

Kingston University in the United Kingdom conducted an experiment to evaluate the effectiveness of short message service in education and teaching. According to the needs of the experiment, they developed a short message service system, which can be used to send information such as course arrangements, examination arrangements and test scores to learners. The experimental design is as follows: Participate in the learning of the experiment

Participants were randomly divided into five groups, one group obtained information through E-mail, another group consulted information through Web, and the remaining three groups received information through short message service. Through this experiment, it is found that compared with E-mail and Web, learners are more inclined to obtain information with SMS as the carrier in some situations. Learners generally believe that the information received via SMS is more personalized and convenient.

4. Lifelong learning and problem-based learning. One of the most famous research projects in the field of mobile learning is the HandLeR research project of the University of Birmingham in the United Kingdom. The project seeks to gain a deeper understanding of the learning process in different contexts and explore the feasibility of lifelong learning, with a focus on how to design human-centered communication systems. The researchers also explored other topics such as concept graphs, knowledge sharing, lifelong learning, wearable learning technologies, and communication between mobile learners. At present, the research team has developed a mobile learning tool for children aged 9 to 11, and the experimental results are satisfactory.

Regarding the study of problem-solving-based learning, the University of Oslo in Norway has launched a project called Knowmobile. This project attempts to use PDAs and smartphones in medical education. Students participating in the project were assigned to study using different mobile devices in different learning environments. The research project concluded that the handheld computer not only serves as a personal digital assistant, but also provides a channel for people to communicate and cooperate in this complex and interconnected social network.

3. Problems and challenges faced by mobile learning

While mobile devices are getting smaller and smaller, their functions are getting more powerful. People can already transfer learning materials or access network resources through mobile devices. Although mobile learning systems have been deployed in many fields in the past few years, its future development still faces many problems and challenges. For example, network infrastructure cannot keep up with the needs of mobile device development. The current broadband network cannot effectively transmit mobile learning materials, and wireless signals have not yet covered many remote areas. Atwell recommends downloading online learning and online materials to mobile devices so students can study in places without internet access. In addition, due to the lack of fully mature network standards, it is still a challenge for educators to develop and implement mobile teaching systems. It is still relatively difficult to develop a mobile teaching system that can run on any mobile device . The current solution is that educators need to design different versions of teaching content for different mobile devices. In order to improve the flexibility of the mobile teaching environment, there must be a corresponding solution to make the same part of the teaching content compatible with different mobile devices, or there is already a basic framework that can automatically convert the teaching content into the content of the device according to different mobile devices. This gives students the freedom to choose to use their preferred mobile device.

4. Future prospects of mobile learning

In an interview, Dr. Van ter Hooft talked about trends in mobile learning research and practice:

First, the network will be truly mobile, rather than a mobile network operating alone. We have access to more digital content and web-based applications through a variety of devices, including mobile phones. This will help to narrow the gap between the use of digital technology inside and outside the school. Among them, cloud computing

Will become more important because it provides a new, low-cost way to collaborate, store files and applications based on the Web environment.

Second, there will be more, personalized networks in the future. Users (including students) will increasingly determine what to access and how to acquire, build, customize, aggregate and share digital information. For education, this means that the one-size-fits-all teaching model will no longer be the dominant model.

Third, mobile devices and related applications will become more sophisticated and multifunctional. Web tools will integrate multiple functions, and the way of human-computer interaction will change, such as more use of touch screens, gestures, and voice input. In addition, we will see more and more differences between digital technologies and their environments.

interaction between. We already have technologies for this, such as GPS, smart objects, and physically labeled data. Finally, there will be many changes in the learning tools we use. Games, for example, will become a more important learning tool.

5. Conclusion

Mobile learning has become an inevitable trend, so researchers should reduce the various criticisms of mobile learning, and instead focus on positive propositions such as how mobile learning can effectively improve learning efficiency and expand education penetration. And many educators are optimistic about the potential of mobile learning. Wagner is convinced that mobile learning represents the future of technology-enhanced teaching. At present, domestic research on mobile learning is still lacking, especially empirical research. China has the world's largest number of entrances using mobile devices, so mobile learning has more potential. The popularization of mobile learning in the future requires the efforts of educators and instructional designers. Working together, a country that loves learning will be strong and great, and I have full confidence in my motherland.

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