コンピュータ＆エデュケーション**Vol.4**

C O N T E N T S

「論文概要」

論文「メディアを活用したプロジェクト型学習環境の構築と運用
：慶應ＳＦＣ「社会調査法」の試み」

妹尾　堅一郎（産能大学）、藤本　徹（株　ナガセ）、
橋爪　良治（慶應義塾大学・学生）

＜概要＞
1996年秋学期、慶應義塾大学湘南藤沢キャンパス（以下、ＳＦＣと略す）の共通基礎 科目「社会調査法（妹尾堅一郎担当）」の授業において、約250名の受講生が約70組 のグループに分かれ、社会調査のプロジェクトを実際に行なった。これを、わずか1 名の教師と4名のＳＡ（student assistant）のみで常時指導していくことを可能にし たのがデジタルメディアの活用である。このことは、電子メールとホームページとい った既存のメディアツールを活用しただけでも、新しい「メディア活用授業」の開発 と運用を効果的に行なうことが可能であることを示した。本論では、本授業を「メディアを活用した学習者志向の学習環境の構築と運用、ならびにプロジェクト型授業運 営の開発」と位置づけ、大学の新しい授業形態の試みとして考察する。

キーワード：メディアによる学習環境、電子メール、ホームページ、学習者志向、プロジクト型授業

「採水場所決定のためのプログラムの作成　-身近な自然環境の探索を兼ねて-」

榊原　正明（鳥取大学）、立花　良一（鳥取大学・院生）、
松本　法子（鳥取大学・院生）

＜概要＞

学生実験で使用する検水の採水場所の決定をコンピュータを用いて行うために、 Visual Basic Ver.4.0でプログラムを作成した。複数のパソコンを同時に使用するこ とにより、選択時の混雑を解消することができた。また、使用したパソコンをLANで 接続したことにより、採水場所の重複を避けることができた。

採水場所は、鳥取市内の主な河川と大学周辺の湖山池を中心にコース分けを行い、 これらのコースごとに採水しやすい橋等の周辺を採水地点として選定した。

プログラムは、鳥取市の概略図から各コースを選択し、採水地点ごとに周辺の地図 と写真を見ながら採水場所を決定する、というものである。学生に採水地点の写真を 提示することにより、周囲の自然環境をも示すことが可能となった。これは、学生に 身近な自然環境についての関心をも持たせる動機づけとしても有効であった。

キーワード：川、池、採水、地図、写真、Visual Basic、ＬＡＮ

「ドリル型CIA教材中のサウンドヒント利用を通した
日本語学習者の学習ストラテジー分析」

池田　伸子（九州大学）

＜概要＞

教育現場へのコンピュータ導入の増加にともなって、多くのCAI教材やマルチメデ ィア教材が開発され、教育に利用されている。しかし、教材そのものや教材の教育効 果についての評価法や評価基準が現在のところまだ確立されていないことから、語学 教育の現場でのCAIに関する研究の多くは、開発に関するものである。そこで、筆者 は独自に開発した外国語としての日本語CAI教材を利用した授業を通して得られた音 声ヒント利用に関する学習履歴を分析することによって、成績上位者と下位者の学習 ストラテジーの違いを 調査した。調査の結果、成績上位者と下位者とでは音声ヒント利用の量およびタイミングに差があることが明らかになり、それは彼らの学習ストラテジー使用の違いによ るものであろうと推察された。

キーワード：日本語教育、ドリル型CAI教材、音声ヒント、学習ストラテジー

「キャンパスネットワークの構築と問題点～東京水産大学の事例～」

島野　顕継（大阪工業大学）

＜概要＞

大学における研究、教育環境のインフラストラクチャとしてネットワークは重要 な役割を果たす。そのキャンパスネットワークの構築例として、東京水産大学の事 例を述べた。 現在運用しているネットワークでは、 幹線として2本のFDDI(光ファイ バー)、 支線として建物ごとにEthernetが敷設されており、学生や教職員が頻繁に 利用しているが、1つのハードウェアがダウンすればネットワークの機能がほぼ停止する、運用スタッフが足りない等の問題点を抱えている。

キーワード：インフラストラクチャ、キャンパスネットワーク、構築

「思考の鏡としてのコンピュータの利用」

豊原　芳史（広島県大竹市立小方中学校）

＜概要＞

広島･教育工学研究会は，豊原が中心となり簡単な操作でコンピュータ上で作図で きる，学習用ツール型ソフトウェア（作図ツール）について研究している。1995年（ 平成7年）の実践では，探索的な学習活動を支援する幾何領域の教材の開発と，この 教材を利用した学習が及ぼす，知識・理解面，情意面への影響を測定することができ た。この成果を基礎とし1997年は，研究対象を関数領域に拡大するとともに，教材を より有効に活用する方法について探ってみた。

　これまでのところ，探索的な学習活動を支援する関数教材の開発とこの教材を活か すカリキュラムの試行，教材を利用した探索的な学習活動の知識・理解面への影響調 査と研究を深めることができた。引き続き，幾何領域において実践中であり，本稿は 関数領域までの取り組みの成果を報告したものである。

キーワード：学習用ツール型ソフトウェア、作図ツール、教材開発、動的幾何

情報メディア環境下でのグループ学習によるプログラミングの演習」

長谷川　聡（名古屋文理短期大学）

＜概要 ＞

　短期大学の情報処理専門科目としてのプログラミング教育において、学生が自ら目標を 設定し、コンピュータネットワークをはじめとする情報メディア環境を積極的に活用 しながら、実践的なソフトウェア開発の方法論や技法を学ぶことを目指して、グループ学K型 の教育を取り入れた。学習過程でのメディア環境の利用とグループ学習の効果について事例の報告とともに論じる。

キーワード：プログラミング教育、グループ学習、情報メディア、 コンピュータネットワーク

「経営系修士論文作成とホームページの活用」

Chang Shu-Ming, 若林　靖永（京都大学）

＜概要＞

　経営・マーケティング関係を学ぶ大学院生のなかで、大学院で学びその成果をもと に民間企業等に就職するケースが増えてきている。本事例紹介は、修士論文の作成お よび就職活動において、ホームページの作成・活用が重要な役割を果たしたことを紹 介したい。

キーワード：ホームページ、大学院教育、経営、マーケティング、就職

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C O N T E N T S

Special Reports

A Trial to Construct a Network for Physics Educators to Develop Cooperatively and Use Mutually Educational Materials

Yasuo Hara
Teikyo Heisei University

Abstract

To make introductory physics education in universities more attractive to students group studies have been carried out for about ten years. Through trials we have learned that modularized educational materials are useful and that in education physics educators of different universities should operate competitively but that in development they should work cooperatively. Thus, we have started to construct NEP, the Network of Physics Education, to develop educational materials cooperatively and to exchange useful information on physics education and to use educational materials developed by others,by using the Internet. In this article present status of NEP is reported. Some of the problems facing Japanese physics educators are reported briefly.

Keywords：physics education, university education, network, educational materials

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Development of Network for Science Education Using Internet & JAVA - by Collaborative Activities in NEP and JAVA-mailing-list for Physics Education Abstracts

Akizo Kobayashi

NEP (Network for Education of Physics) is a group of both physics researchersand educators and it originates from a project supported by grant-in-aid from the Ministry of Education, Science, Sports and Culture. Many NEP members of the physics educators are collaborating to develop new types of networking system for physics education using Internet, multimedia and JAVA in order to improve the way of physics teaching. For this purpose, in January 1997, we also started a new collaboration with JAVA-ML(mailing list) for physics education. By exchanging useful informations using this JAVA-ML, many collaborative activities of this group have started to develop interesting JAVA simulations in physics teaching materials. In this article, we will describe the outline of these activities. Futhermore, we will report some typical results of these collaborations in physics education using Internet and JAVA simulation.

"What is the Chemical Education Journal?"

Yoshimichi Oikawa
Laboratory of General Education for Science and Technology,
School of Science, TOKAI University

Abstract

A electric journal on the World Wide Web published articles that incorporate digital elements that not possible to print - articles that include such as animation, video, embedded or linked documents. The Chemical Education Journal (CEJ) is also this type of journal. It is published for contribution to advance of chemical education and its activity. Anybody who can connect the Internet will utilize CEJ. There are few electric journals as CEJ that treat chemical education on the Internet. In this report, "Why was it born ?", "What dose it publish ?" and "How do you read it and contribute to it ?" are describe.

Keyword: chemical education, electric journal, World Wide Web

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Multimedia and Network
--- Trials and Results in Shinshu University with its widely distributed campus ---

Masayuki Yabe

Abstract:

"SUNS"(Shinshu University video and data Network System) is a project in which computer networks are utilized as multimedia information (images, sounds, etc.) networks. The project started in Shinshu University in the field of higher education in Japan. Shinshu University has a vast campus distributed widely throughout Nagano prefecture. We expected to overcome this disadvantage of separated campus and furthermore change it to a merit by using SUNS. Remote education has been operated between separated campus through a multimedia network, SUNS, since 1987. The outline of this system, SUNS, and an example of remote education are reported in this paper. A comparison between an ordinary way of lecturing and remote education is also shown. Finally some possibilities to improve the method of remote education through networks are mentioned.

Keywords; Remote education, Network, Images, Multimedia

A Learning Environment of Science Education through the Net among Children and Scientists ～A Perspective of Communication and Learning～

Noyuti Mima

This paper discusses relations between communication and learning based on some results from an experimental practice of education. This practice plans to provide children opportunities to become interested in "doing science" through computer networked activities with young scientists, including a Q&A exchange about children¶s questions in everyday life. In this practice, communication among participants gradually became better, and such communication induced them to expand the world of their learning.

Key Word Learning environment, Computer network, Science education, Community of learning, Communication

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Can We Perform Some Statistical Intuitions via Computer Simulation?

Jiro Suzuki

abstract

It is known that ``Though science gives us an objective solution for a question, it does not tell us that the question is right or not." Statistical method is one of the most important methods in science, and the method has the same weak point. Basic statistical methods are easier by using a personal computer. Advanced statistical methods are also familiar. Therefore, we have to think especially that ``Science does not tell us that the question is right or not." I have started to design a statistical curriculum using spreadsheet software that oriented to the above problem on statistics.

Keyword: scientific method, education of statistics, simulation, heuristic learning

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Chemistry Education in Conjunction with Computational Chemistry.

Akira NAKAMURA, School of Medicine, Akita University

abstract:

For the topic of chemistry as a major, the concept of Computational Chemistry has been implemented in my class

for many years. During the first several years, the algebraic computation program, e.g., REDUCE had been employed, which proved to be effective from this point of view. The demerit of using REDUCE, however, can be pointed out as a fact that the introduction of REDUCE programming technique which has no relation to the main theme of the class, cannot be avoided. This difficulty can be overcome by using the ordinary Spreadsheet Software like Microsoft Excel. The Spreadsheet Software is now recognized as one of the most common literacy training subjects for all freshmen. In this report, using tools in Excel, two examples of supplemental methodologies related with the Eigen Value Problem and the Deconvolution Technique in Spectroscopy are discussed, both of which are very useful concepts of the practical applicability for the students of chemistry major.

The establishment of scientific entertainment
--- The revival of amateur science ---

Satoshi Sakai
School of Earth Sciences, IHS, Kyoto Univ.

The unpopularity of natural science nowadays is not just a problem of students but a consequence of the change of social consciousness towards natural science .To put a brake on this it is important for us to promote narural science not as "an useful knowledge" but as "a culture" such as music and art. At the same time it has to be fun not only for professional scientists but also for amature scientists .

Keywords:Unpopularity of Natural Science, Amature Science

□ ***Articles*** □

The setting and management of a project style 'learning environment'
with d igital media:
A media-based, learner-oriented education of 'Social Research (inquiry)'
class at KEIO University SFC.

Ken SENOH School of Management and Informatics Sanno College Toru FUJIMOTO Nagase Brothers Inc. (former student of Keio University) Ryoji HASHIZUME BA course in Fuculty of Environmental Communication, Keio U niversity

Abstract In the fall term of 1996, in a 'Social Research (inquiry)' class at KEIO University SFC campus, about 70 groups of over 250 students took part in so cial inquiry projects with Soft Systems Methodology (SSM). This class was su pervised and supported by only one teacher and four student assistants. Uti lization of digital media; e-mail and homepages in WWW made this possible. T his trial shows that only common digital media of e-mail and homepages make s it possible to set and manage a 'learner- oriented leaning environment'. This paper reports some details of the experimental class and discusses som e outcomes. Then, lessons from the outcomes are discussed. Finally ideas fo r the future class management and the research are considered.

Keywords: Learning environment with Digital media, E-mail, Homepage, Learner-oriented, Project style education

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Design of a Computer Program for Specifying Water Sampling Sites Through a Search of the Local Environment

Masaaki Sakakibara,Ryoichi Tachibana ,Noriko Matsumoto

Abstract

A computer software program for specifying water sampling sites used for student experiments was designed with Visual Basic software (Ver.4.0). By connecting student personal computers with LAN, access congestion and an overlap of water sampling site choice was avoided. Water sampling sites were divided into several "courses" mainly in the river areas in Tottori City and in the Koyama Pond area near Tottori University. Each of these courses was designed for ease of water sampling in sites situated near bridges, etc. The software program was able to choose

each course from a schematic map of Tottori City and decided water sampling sites using maps and photographs from each area. The program was effective in building student interest in the natural environment by use of photographs of the water sampling sites.

Keywords: pond, river, water sampling, maps, photographs, Visual Basic, LAN

An Analysis of JFL Students' Learning Strategy through Their Ways of Using the Sound-Hint of Computer-Based Drill

IKEDA Nobuko

Abstract

This study investigated JFL (Japanese as Foreign Language) learners' learning strategies by their ways of using the Sound-Hint of Computer-Based Drill. Twenty one foreign students participated in this study. And they were divided into two groups (upper and lower ones). They studied Japanese grammar, Kanji, vocabulary through Computer-Based Drill for four months, then their record of using sound-hint was collected. T-test was employed to analyze the mean numbers of the sound-hint used in CAI material between two groups. And the timing of using sound-hint was compared between two groups. The results showed that significant differences were found between two groups on the numbers of using sound-hint in their use of Grammar, Vocabulary drills, and there was some differences on the timing of using sound-hint between two groups. The study's conclusion was that the difference found in this study comes from the difference of students' use of learning strategies. Further study is needed to investigate the effect of instruction of sound-hint usage to poor learners.

Keywords: Japanese Language Instruction, Computer-Based Drill, Sound-hint, Learning Strategy

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Implementation of an Campus Network
～ Empirical Case in Tokyo University of Fisheries ～

Akitsugu Shimano

Abstract

The computer network is useful in researching and educating at universities. The campus network was constructed at Tokyo University of Fisheries. The network have two FDDI (Fiber Distributed Data Interface) loops as a backbone and Ethernet in each school building. The problems of the network are as follows:

1)The function of the campus network will be stopped when one hardware is not in operation.

2)There are insufficient administrators of the network.

Keywords: Infrastructure, Campus Network, Construction

The Use of Computer as a Mirror of Thinking
---The development of interactive animated learning materials and a practical research on its influence(an interim report)---

Yoshifumi Toyohara

In Hiroshima Educational Technology Research Center we are trying to develop a learning tool software(chart tool) that enables students to draw figures or make charts easily on the computer. In 1995 we developed a geometry learning material to support students' study, to enable students to find answers by themselves. We also investigated the influence the use of this learning material had on students' study from the viewpoints of knowledge, understanding and feelings. In 1997, with these results, we extended our research to the field of function and searched a better way to use learning materials . We are still working on the development of function learning material and the curriculumn to use it, the influence it has on students' knowledge and understanding. We will give

an interim report of our practice,research and results so far.

Computer Programming Education by Group Learning and the Information Media Environment

Satoshi Hasegawa

Abstract On education of computer programming at the junior college, we used a group method in order to make students easy to communicate and teach each other, and also to use the information media environment. This paper will report how we did the group style learning in programming education, and discuss it's effect and use of the information media especially of computer network.

Keywords: Programming education, Group learning, Computer network

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Master Paper Writing and Web Site on Credit Card Network

Chang Shu-Ming, Yasunaga Wakabayashi

A Master Paper Writing and A Web Site on Credit Card Network author: Chang Shu-Ming, Yasunaga Wakabayashi Abstract: Recently many graduate students study graduate courses of business administration and marketing, and get job opportunities of firms and so on. This report shows that it is more important to create and use a web site in order to write a master thesis and find a job of specialist. keyword: Homepage, Web Site, Graduate Course, Business Administration, Marketing, Job Opportunity