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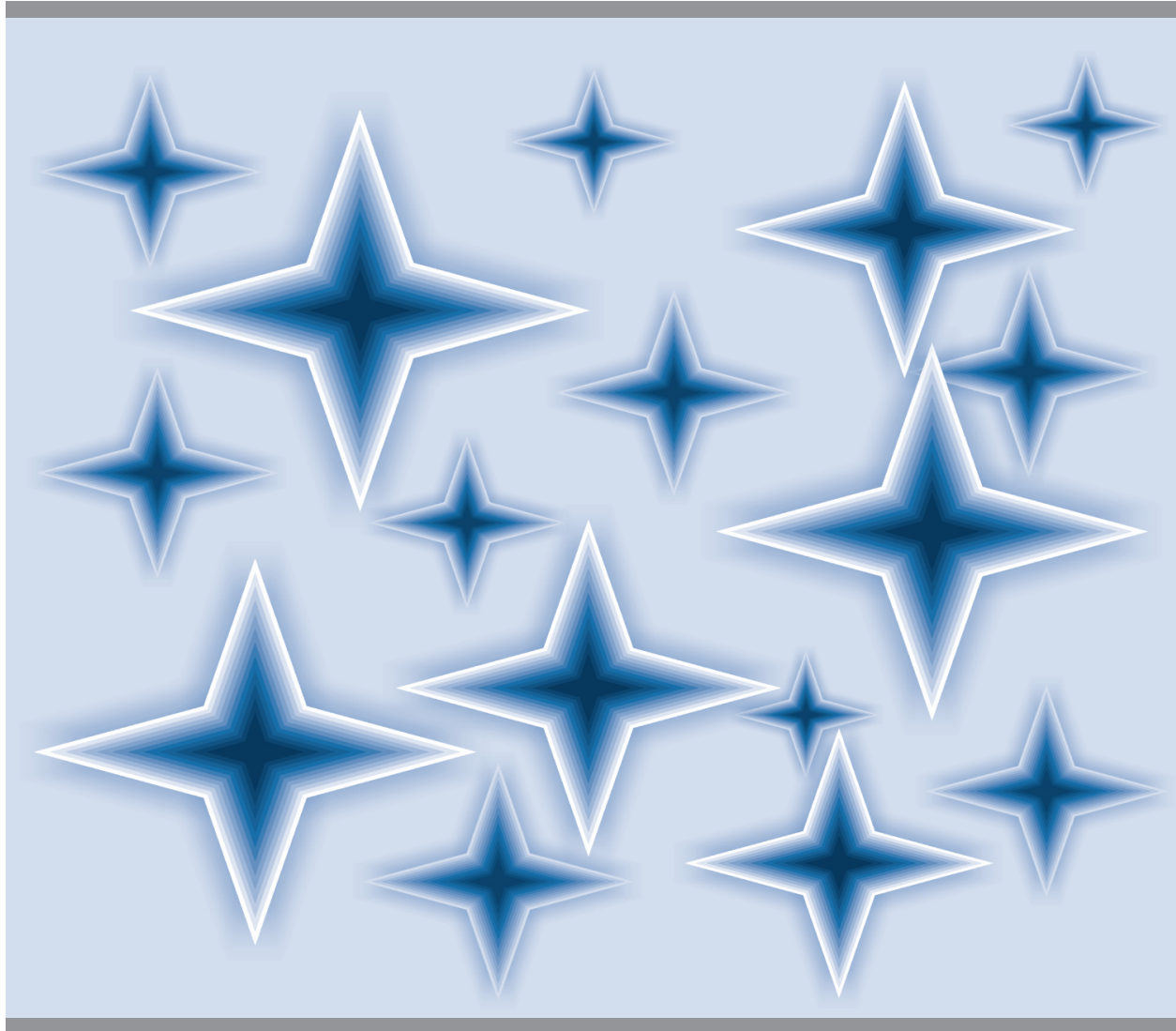
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CONTENTS

Distance Education for adult

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Abstract: Distance education is education designed for learners who live at a distance from the teaching institution or education provider. It is the enrollment and study with an educational institution that provides organized, formal learning opportunities for students. Presented in a sequential and logical order, the instruction is offered wholly or primarily by distance study, through virtually any media. Historically, its predominant medium of instruction has been printed materials, although non-print media is becoming more and more popular. It may also incorporate or make use of videotapes, CD or DVD ROM's, audio recordings, facsimiles, telephone communications, and the Internet through e-mail and Web-based delivery systems. When each lesson or segment is completed, the student makes available to the school the assigned work for correction, grading, comment, and subject matter guidance by qualified instructors. Corrected assignments are returned to the student. This exchange fosters a personalized student-instructor relationship, which is the hallmark of distance education instruction. istorically, most distance education courses were vocational in nature, but today courses are offered for academic, professional, and avocational purposes for students of all ages. There are numerous specialized programs, such as those for blind persons and for parents of small children with hearing impairments.
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Introduction:

Distance education in America and for the first time at the University of Illinois Veslin was implemented in 1874. In 1900, university education through correspondence, face became more public. National Association of Home Education in 1926 and led the establishment of distance education and related programs in universities and schools, and more important aspect to find drivers. Education in 1920 invented the radio and TV appearance in 1940 led to important new techniques in communications that the nature of the field of distance education also created dramatic changes.

. Trainers using these new technologies were successful educational programs to millions seek learning opportunities and thereby reach out to the educational spaces, training centers to expand. With the development of long-distance telephone system in the early twentieth century method of capacity and distance learning methods for students to access educational opportunities in the world increased Translation. But until the invention of mobile tele conference ever in the 80 and 90 and the main role in the concept of distance education did not play. Telemetry system, allowing for teachers conference provided that without the slightest delay at a time when your students can listen to them talk and sometimes they see.

Expansion of computer networks in the decade 1990 and connect millions of people through lines to the telephone networks made it possible to simply distance learning via computers and computer conferences around the world is possible (a) and Today with the development of control technology in science and technology around the world are.

Distance education is available in practically any field, from accounting to zoology. Courses are offered in gemology, high school diploma, journalism, locksmithing, child day care management, yacht design, and many fascinating subjects. Distance education courses also vary greatly in scope, level, and length. Some have a few assignments and require only a few months to complete, while others have a hundred or more lesson assignments requiring three or four years of conscientious study.

Since 1890, more than 130 million Americans have studied at DETC member institutions, including Franklin D. Roosevelt, Walter P. Chrysler, Walter Cronkite, Barry Goldwater, Charles Schulz, and many other distinguished alumni of DETC members. Unlike most distance education courses offered by traditional colleges and universities that are semester and classroom oriented, with courses offered by most of the DETC-accredited institutions you can study any time and anywhere. Distance education is especially suited for busy people who wish to increase their knowledge and skills without giving up their jobs, leaving home, or losing income. You learn while you earn. Many courses provide complete vocational training; others prepare you for upgrading in your present job, without losing wages, experience or seniority. You receive individual attention, and you work at your own pace.

In recent years, technology has played a significant role

in transforming the traditional distance education school into a dynamic, interactive distance learning method using toll-free telephone lines, as well as a diverse array of personal computers, video devices, CD and DVD ROMs, online courses over the Internet, interactive devices, and other modern technological innovations. The future for distance study promises to be exciting.

Distance education is education designed for learners who live at a distance from the teaching institution or education provider. It is the enrollment and study with an educational institution that provides organized, formal learning opportunities for students. Presented in a sequential and logical order, the instruction is offered wholly or primarily by distance study, through virtually any media. Historically, its predominant medium of instruction has been printed materials, although non-print media is becoming more and more popular. It may also incorporate or make use of videotapes, CD or DVD ROM's, audio recordings, facsimiles, telephone communications, and the Internet through e-mail and Web-based delivery systems. When each lesson or segment is completed, the student makes available to the school the assigned work for correction, grading, comment, and subject matter guidance by qualified instructors. Corrected assignments are returned to the student. This exchange fosters a personalized student-instructor relationship, which is the hallmark of distance education instruction.

Educational methods in distance learning:
Today, under the new system replaced the traditional systems of learning and learning week (ie tutoring methods, lectures) are:
- **Multimedia courses:**
These courses and widely used elements of image, communication, graphics and simulated components, animation and communication elements for guidance and tips, and talk back on course and curriculum issues are held.
- **Enhanced communication mechanisms:**
The mechanism of any texts simultaneously, and asynchronous audio-visual communications to protect you. This case allows students to practice on topics learned will give.
- **Written test:**
 thus, question and test via a distributed communication network, are corrected and returned. These exams through video conferencing support and runs**.**
- **Virtual Seminar:**
thereby different groups of students in different geographical environments linked together makes.
- **Collaborative virtual laboratories:**
 the laboratory of the Group's activities are supported. Workshops such as software engineering.
-**Smart academic factors:**
 academic factors that inform intelligent, support and

guidance students pay.

Remote educational tool:
distance learning tools and supplies various uses. These tools in four main courses are:
A - Audio Tools:
Audio tools include training such as two-way interactive telephone, video conference, shortwave radio and a strain of tools such as audio tape and radio.
B - Image tools:
including slides, films, video tapes and video conferences.
C - Data:
computers as electronic data are sent and received. Because the data word description for a wide range of educational tools is used.
Computer applications for distance education are varied and include the following:
1- Training to Computer Management.
 2 - Computer Assisted Instruction.
3 - through PCs.
4 - e-mail, telegraph, computer conference and the World Wide Web simultaneously.
D - Print:
The main element of distance education programs, particularly in the exchange and delivery system information tools are considered.

Key factors in the process of distance education:
the process of remote training, the following factors contribute:
- **Students:**
Regardless of educational content, role and main element in the learning process students are responsible.
- **Coaches and Teachers**:
Success depends on a lot of educational activities the ability, skills and knowledge are the coaches and professors.
- **Facilitators of communication**:
Facilitator bases, as the bridge between students and mentors are. Must base expectations of teachers and educational needs of students and service coordination and communication to create.
- **Support staff:**
 One of the important pillars of any development of distance education programs, by development group finds. Operational support staff such as student registration, copy and distribute their resources, order textbooks, security and copyright, and are responsible for the report.
- **Management:**
 The group decision makers, builders and judges are considered to be educational and should be considered among the factors above, establish the correct relationship formation.

Types of Distance Education Programs:

There are two types of programs offered by distance education schools: synchronous learning programs and asynchronous learning programs. With synchronous learning, distance education students must log on to the school's website at a set time. Often, they interact with their peers and professors via group chats, web seminars, video conferencing, and phone call-ins. With asynchronous learning, distance education students complete all coursework on their own time. They often learn via assignment sheets, message boards, email, pre-recorded video lectures, mp3s, and traditional mail correspondence.

Distance education began for the delivery of courses to students who live in remote areas. Over the years, though, this form of education has become the preferred method for learning outside of the classroom.

Distance Education is now undertaken by people with busy schedules, hectic lifestyles, special needs, and also those living in isolated areas. What's more, with such flexible learning options you can choose to study at any time and from any location you like.

There are a number of different **forms of distance education** and it's important to know which method you prefer:

- **Correspondence learning:** your course materials are printed and sent out to you by mail/courier. The advantages are that you have a printed set of reference materials, you can study anywhere and you are not reliant on a computer, you can learn for long periods of time.
- **eLearning:** your course materials are provided to you in multimedia format; that is, on CD/DVD. In this way you can choose to take your study materials within you and learn anywhere in the world with just a laptop.
- **Online learning:** no materials are sent to you and you do all your learning online. The limitation is that you need to be logged onto a computer (though you may be able to download and print some of your materials yourself, though this can cost you more in ink), there is a limit to how much you can absorb and do online, and most people's attention span on-screen is limited to 20 minutes (your eyes get tired after that).
- **Broadcast learning:** where you tune into a series of television, radio or Internet broadcasts (e.g. podcast, YouTube, etc.).
- **Teleconferencing:** where your lessons are conducted in real time through an Internet connection. Limitations are that streaming can be slow, connections can cause problems (students and teachers generally need to be computer literate) and there can be delays in talk-time, depending on software, hardware and connection capabilities.

Conclusion:

Telecommunications systems carry instruction, moving information instead of people. The technology at distant locations are important and affect how interaction takes place, what information resources are used, and how effective the system is likely to be.

Technology transports information, not people. Distances between teachers and students are bridged with an array of familiar technology as well as new information age equipment. What sets today's distance education efforts apart from previous efforts is the possibility of an interactive capacity that provides learner and teacher with needed feedback, including the opportunity to dialogue, clarify, or assess. Advances in digital compression technology may greatly expand the number of channels that can be sent over any transmission medium, doubling or even tripling channel capacity. Technologies for learning at a distance are also enlarging our definition of how students learn, where they learn, and who teaches them. No one technology is best for all situations and applications. Different technologies have different capabilities and limitations, and effective implementation will depend on matching technological capabilities to education needs.

Distance education places students and their instructors in separate locations using some form of technology to communicate and interact. The student may be located in the classroom, home, office or learning center. The instructor may be located in a media classroom, studio, office or home.

The student may receive information via satellite, microwave, or fiber optic cable, television (broadcast, cable or Instructional Television Fixed Services (ITFS), video cassette or disk, telephone - audio conferencing bridge or direct phone line, audio cassette, printed materials - text, study guide, or handout, computer - modem or floppy disk, and compressed video. Recent rapid development of technology has resulted in systems that are powerful, flexible, and increasingly affordable. The base of available information technology resources is increasing with dramatic speed. Much has been learned about connecting various forms of technology into systems, so that the ability to link systems is growing. Most distance learning systems are hybrids, combining several technologies, such as satellite, ITFS, microwave, cable, fiber optic, and computer connections.

Interactivity is accomplished via telephone (one-way video and two-way audio), two-way video or graphics interactivity, two-way computer hookups, two-way audio. Interactivity may be delayed but interaction

provided by teacher telephone office hours when students can call or through time with on-site facilitators. Classes with large numbers of students have a limited amount of interactivity. Much of the activity on computer networks is on a delayed basis as well. Possibilities for audio and visual interaction are increasingly wide.

In the earlier days of distance learning, it was most common to see distance learning used for rural students who were at a distance from an educational institution. The student might watch a telecourse on a television stations, read texts, mail in assignments and then travel to the local college to take an exam. This model is still in use, but as the technology has become more sophisticated and the cost of distance learning dropped as equipment prices dropped, the use of distance education has increased.

High front-end costs prevented an early widespread adoption of electronically mediated learning. Distance learning has been aggressively adopted in many areas because it can meet specific educational needs. As the concept of accountability became accepted and laws required certain courses in high school in order for students to be admitted to state colleges, telecommunications was examined as a way to provide student access to the required courses. Many rural school districts could not afford the special teachers to conduct required courses. Distance education met this need by providing courses in schools where teachers were not available or were too costly to provide for a few students. It also fulfilled a need for teacher training and staff development in locations where experts and resources were difficult to obtain. These systems link learner communities with each other and bring a wide array of experts and information to the classroom.

Challenges which faced the early users of distance education are still with us today. If distance education is to play a greater role in improving the quality of education, it will require expanded technology; more linkages between schools, higher education, and the private sector; and more teachers who use technology well. Teachers must be involved in planning the systems, trained to use the tools they provide, and given the flexibility to revise their teaching. Federal and state regulations will need revision to ensure a more flexible and effective use of technology. Connections have been established across geographic, instructional, and institutional boundaries which provide opportunities for collaboration and resource sharing among many groups In the pooling of students and teachers, distance learning reconfigures the classroom which no longer is bounded by the physical space of the school, district, state or nation.

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Teachers of Adults: Methods and strategies for better teaching

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Abstract: Adult who is able to recognize their needs. He is who knows what will. Refers to individual adults in their lives cross and understand their responsibilities and has accepted the role is social. Adult learners are often those that distinguish each other and have many different targets at the same time and will follow a common challenge to fulfill the goals of building self motivation vectors as educational materials to learn and use the forge. For most adults, being out of the classroom for even a few years can make going back to school intimidating. If they haven't taken a class in decades, it's understandable that they would have some degree of apprehension about what it will be like and how well they'll do. It can be tough to be a rookie when you've been an expert in your field for many, many years. Nobody enjoys feeling foolish. Your job as a teacher of adult students includes being positive and encouraging. Patience helps too. Give your older students time to respond when you ask a question. They may need a few moments to consider their answer. Recognize the contributions they make, even when small. Give them words of encouragement whenever the opportunity arises. Most adults will rise to your expectations if you're clear about them. A word of caution here.

Introduction:

Several definitions of adult education has been done Community

- Adult Education is a⌉in the following examples are given of them. conscious effort by public institutions or voluntary organizations to promote community awareness comes action.
- adult education teaching is typically specific age group above the legal age⌉ limits as formal and informal, voluntary and at different levels of time, place
- Adult Education is a process in which people who⌉and education is presented. somehow been cut course they consciously to change or advance their skills in information and do organized activities.
- Adult education includes all formal and informal training and volunteer after⌉ school,

which by experienced educators and aware of the system.

Educational materials on adult education with daily life, needs, goals, aspirations and past experiences of adults and their relationship helps to results learned in life and career are used in developed countries, adult education is a form of informal education for people above 24 years is presented. In fact, a means of expanding knowledge, skills and abilities of adults. In these countries, adult education helps adults to variable conditions of political, social, economic and cultural adjustment, and pay to fix their shortcomings.

In developing countries and backward because the problems in primary education, lack of resources and facilities, poverty, social existence, economic and cultural concept of adult education is different. In such countries the concept of adult education, literacy education is.

Concept of adult education in revolutionary countries, is a combination of these two concepts. Changes in these countries due to social, political and cultural revolution, resulting from, literacy and continuing education necessary to find because of the revolution, there is cultural poverty on the other hand the implementation of development plans and the need for skilled personnel are expert. General adult education system based on economic conditions - social and cultural community is different and each specific goals will follow. General objectives of adult education and literacy in two categories is divided into professional education.

Literacy goals include:
- Providing primary education in childhood that adults were deprived
- raising awareness for adults;
- knowledge bases and adults about their cultural heritage;
- increase confidence in adults.

Professional education goals include:

- Equipped with the necessary skills to adults living;
- providing the necessary manpower for the country's goals;
- achieving social equality and equity and eliminate the existing differences between different classes.

Adult characteristics:
to understand the characteristics of adult learners, their mental and physical condition should be considered in the following referred to some of them.

Operating speed:
slow reaction in adults is natural that necessarily means reducing the logic and practice skills, not due to weakness and increased awareness of natural forces and their skills.

Consciousness:
no stimulus and incentives encouraging, despite inhibiting stimuli, slow transfer rate, mental, and weak inhibitors of natural forces (mostly visual and auditory) are factors that slow reaction affect individual mental and cognitive activities, but never able to understand, understanding and learning ability (which varies with the speed of learning) is not relevant.

Health:
what is most age, longer duration is necessary to be heard by listening issue. Why is that when elderly people and old could not hear well, their confidence and vulnerable to the possibility that negative beliefs about their find, they are great. Visual abilities can be like other people, usually decreases with age.

Background of knowledge - skills and beliefs of adults:
adults, social experiences, many have already learned different values and beliefs in their pronouns have stabilized, so changes in the new act very cautiously. The idea of such a manner that skill and applying them older and longer life is, Similar resistance to accept new ideas will be more and more severe. Thus, the adult criteria for the built and paid for their ideas and beliefs that are forming. Because of these criteria and the beliefs that they are afraid of failure, Therefore, to prevent it, sometimes against the resistance of new phenomena are only the material taught and its face that make reinforced concrete and tangible interference situation is.

Principles for the Teacher of Adults
Teaching Adult Learners
The teacher of adults has a different job from the one who teaches children. If you're teaching adult students, it's important to understand the five principles of teaching adults. It's important to know how adults learn. Malcolm Knowles, a pioneer in the study of adult learning, observed that adults learn best when:

1. They understand why something is important to know or do.
2. They have the freedom to learn in their own way.
3. Learning is experiential.
4. The time is right for them to learn.
5. The process is positive and encouraging.

Principle 1: Make Sure Your Adult Students Understand "Why"
Most adult students are in your classroom because they want to be. Some of them are there because they have Continuing Education requirements to keep a certificate current, but most are there because they've chosen to learn something new.

This principle is not about why your students are in your classroom, but about why each thing you teach them is an important part of the learning. I'll use my own pickle-making lesson as an example.

When I learned to make pickles, my teacher and neighbor, Marilyn, explained:

- It's important to soak the cucumbers in ice water over night. This helps make the pickles crisp.
- If you put a towel under the jars in the canner, they won't bounce against each other and break.
- When sterilizing the jars, it's important to fill each at least halfway with water, AND fill the canner they're sitting in with water. Too little water and the towel mentioned in the previous bullet will catch on fire. You know this kind of information comes from experience.

Principle 2: Respect that Your Students Have Different Learning Styles
There are three general learning styles: visual, auditory, and kinesthetic.

Visual learners rely on pictures. They love graphs, diagrams, and illustrations. "Show me," is their motto. They often sit in the front of the classroom to avoid visual obstructions and to watch you, the teacher. They want to know what the subject looks like. You can best communicate with them by providing handouts, writing on the white board, and using phrases like, "Do you see how this works?"

Auditory learners listen carefully to all sounds associated with the learning. "Tell me," is their motto. They will pay close attention to the sound of your voice and all of its subtle messages, and they will actively participate in discussions. You can best communicate with them by speaking clearly, asking questions, and using phrases like, "How does that sound to you?"

Kinesthetic learners need to physically do something to understand it. Their motto is "Let me do it." They trust their feelings and emotions about what they're learning and how you're teaching it. They want to actually touch what they're learning. They are the ones who will get up and help you with role playing. You can best communicate with them by involving volunteers,

allowing them to practice what they're learning, and using phrases like, "How do you feel about that?"

Pickle Example: I'm generally a kinesthetic learner. Marilyn talked to me about her pickling process, explaining why she uses the ingredients she does, and showed me how she dips a liquid measuring cup into the hot brine and pours it into the jar using a wide-mouthed funnel, but my greatest learning came when I fumbled through the second jar all by myself.

Most people use all three styles while they're learning, and of course, this is logical since we all have five senses, barring any disabilities, but one style almost always is preferred.

The big question is, "How do you, as the teacher, know which student has which learning style?" Without training in neuro-linguistics, it might be difficult, but conducting a short learning style assessment at the beginning of your class would benefit you and the students. This information is as valuable to the student as it is to you.

There are several learning style assessments available online, some better than others. I like the one at Ageless Learner.

Share your thoughts about learning styles.

Principle 3: Allow Your Students to Experience what they're learning

Experience can take many forms. Any activity that gets your students involved makes the learning experiential. This includes small group discussions, experiments, role playing, skits, building something at their table or desk, writing or drawing something specific – activity of any kind. Activities also keep people energized, especially activities that involve getting up and moving about.

The other aspect of this principle is honoring the life experiences your students bring to the classroom. Be sure to tap into that wealth of wisdom whenever it's appropriate. You'll have to be a good timekeeper because people can talk for hours when asked for personal experiences, but the extra facilitation needed will be well worth the gems your students have to share.

Pickle Example: Once Marilyn had shown me how to prepare one jar, she busied herself in the kitchen doing her own thing, close enough to keep an eye on me and to answer my questions, but allowing me the autonomy to go at my own speed. When I made mistakes, she didn't interfere unless I asked. She gave me the space and the time to correct them on my own.

Principle 4: When the Student Is Ready, the Teacher Appears

"When the student is ready, the teacher appears" is a Buddhist proverb packed with wisdom. No matter how hard a teacher tries, if the student isn't ready to learn, chances are good he or she won't. What does this mean for you as a teacher of adults? Luckily, your students are in your classroom because they want to be. They've already determined that the time is right.

It's your job to listen carefully for teaching moments and take advantage of them. When a student says or does something that triggers a topic on your agenda, be flexible and teach it right then. If that would wreak havoc on your schedule, which is often the case, teach a bit about it rather than saying flat out that they'll have to wait until later in the program. By then, you may have lost their interest.

Pickle Example: My mom canned pickles all during my childhood years, but I had no interest in participating, or even in eating them, sadly. Several years ago, I helped Marilyn can pickles, and even then, I was simply helping and not really learning. When I finally started enjoying pickles and planted my own cucumbers, then I was ready to learn, and Marilyn was right there to teach me.

Principle 5: Encourage Your Adult Students

For most adults, being out of the classroom for even a few years can make going back to school intimidating. If they haven't taken a class in decades, it's understandable that they would have some degree of apprehension about what it will be like and how well they'll do. It can be tough to be a rookie when you've been an expert in your field for many, many years. Nobody enjoys feeling foolish.

Your job as a teacher of adult students includes being positive and encouraging. Patience helps too. Give your older students time to respond when you ask a question. They may need a few moments to consider their answer. Recognize the contributions they make, even when small. Give them words of encouragement whenever the opportunity arises. Most adults will rise to your expectations if you're clear about them.

A word of caution here. Being positive and encouraging is not the same as being condescending. Always remember that your students are adults. Speaking to them in the tone of voice you might use with a child is offensive, and the damage can be very difficult to overcome. Genuine encouragement from one person to another, regardless of age, is a wonderful point of human interaction.

Pickle example: I'm a worrier. I worried about spilling brine all over Marilyn's stove, about dropping the full jars as I lifted them out of the hot bath, about making a mess of her kitchen. Marilyn assured me that spills were easily cleaned up, especially when vinegar was involved since it's used for cleaning anyway! She encouraged me as I gingerly moved boiling hot jars. Throughout the pickle-making process, Marilyn remained calm, unruffled. She paused by me every once in a while to comment, "Oh, don't they look beautiful!"

Because of Marilyn's understanding of how to teach me, her adult student, the art of making dill pickles, I now have the confidence to make them in my own kitchen, and I can't wait for my next batch of cucumbers to be ready.

This is your challenge as a teacher of adults. Beyond teaching your subject, you have the opportunity to inspire confidence and passion in another human being. That kind of teaching changes lives.

Conclusion:
Additional material for the next stage of learning often means to be expected when developing your trip experiences for learners or transfer is provided, develop knowledge, insight and skills they will.

To ensure that science curriculum and educational aspects, according to community needs and audiences, application form is provided or not, the content selection criteria should be considered. These criteria is being include knowledge, effectiveness, flexibility, diversity, relevance and practical learning.

Some research findings that can be a learning process for the Guidelines for training operations are applied, is given below:

1- Preparation for adults to learn how much he depends on previous learning. Knowledge that has accumulated because of an ability to absorb new information more person is. Past educational experience features a diverse group of adult learners, the starting point of any activity on the diversity training is emphasized.

2- intrinsic motivation, learning a deeper and make them sustainable. When the need is met directly by the learning itself, what is learned, but is complementary learning. Creating a training activity in adult learning needs, learning ensures stable

3- Positive reinforcement (reward) learning to reinforce the negative (punishment) is more effective. Many adults because of negative experiences at the beginning of schooling, are weak and afraid. Feeling of success in adult learning for continuous learning and adult participation is essential.

4- To maximize learning, information must be provided an organized manner. Entries can be simple or complex can be arranged around related concepts are organized. Starting point for organizing content knowledge for adults and adults is linked to past experiences

5- Learning, especially regarding skills development, will be added frequently.

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Indigenous knowledge and modern knowledge: implications and necessities

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Abstract: According to different definitions of indigenous knowledge, it is possible to count it as part of unique culture of each ecosystem or country and that is knowledge and findings which obtained through experience in order to be consistent with certain ecosystem conditions, and changed as part of social and productive culture of that society over time. This acknowledges, represent compatibility methods with nature and establishing reasonable relationship between human and his environment. And has complete harmony with principle of sustainable development, form this viewpoint. Main reason for inattention for Indigenous knowledge in third world countries is that colonist countries don't pay any attention to the peoples' knowledge and information in these countries and always have reminded the people of these colonized countries as a stubborn, superstitious and retrogressive people . On the other hand, the colonist countries attention to industrial productions and agriculture policies has caused to promote industrial and single product agriculture which will influence the Indigenous farmer's knowledge about different productions and will make it inconspicuous.

Introduction:

We have faced decay at environmental issues, especially at vast parts of developing areas of world, in spite of considerable improvement of rivers conditions and air quality at some area such as Europe and north of America. Increased consumption, rare sources and factors such as population growth and imbalanced growth, would endanger, development of different countries (Popzan, 2002). Obviously, economic development can follow unexpected social and environmental affections involving weather changes, using freshwater sources inordinately, decrease living diversity and increase inequality (Gigler, 2003). Sustainable development is outcome of development that follow multi dimensional economic activities with protect environment and its related social issues. So in current decade, presenting indigenous knowledge issue was reinforced in order to present modern approach of development, in which the issue of human-oriented of development would be insisted. In this modern attitude toward development process, environmental, social and cultural concerns were emphasized over economic interests. Indigenous knowledge is part of national capital of each nation which encompasses their beliefs, values, practices, tools and local acknowledges. This is the same knowledge that , different nations had found their foods from nature , prepared their clothing , settled in home , educated their children , organized their society and kept health of themselves and poultries , during the centuries thereby(Eshraghi, 2004) .

Indigenous knowledge of each nation has enabled them to supply their needs from natural sources without reducing these sources. So, indigenous knowledge collection of world is valuable source of practices and time-tested tool that would be useful for sustainable development of all societies.

At third world countries, unconsidered triumph of world development policies has led to various social, economic, cultural and environmental issues (Agrawal, 2002).

Different definitions were presented about indigenous knowledge by experts that each of them present their idea about this knowledge from their viewpoint. Each of them emphasis on a special aspect of indigenous knowledge according to their viewpoint. Oxford vocabulary define the word indigenous knowledge such this" it is created naturally in a region which is related to the people of that region. (Azkia and Imani, 2008). Indigenous knowledge is a knowledge that has been grown in a long time and has transferred from one generation to other generation in hereditary form (Karami and Moradi, 2003). Williams and Molina have defined indigenous knowledge such this: indigenous knowledge is the learning methods, understanding and attitude to the world which is the result of experience and solving problems according to test and error by the people who are active and have used their available resources on its suitable time. Chambers with emphasizing on people's role in development process, believed that the phrase rural people's knowledge is more sensible than the other phrase such ethnic ecology, ethnographic knowledge, ethnic classification. He also believed that indigenous knowledge is a knowledge that is created naturally and

is emanated from geographical circle. (Chambers, 2000).

unlike development that is dependent on using maximum of natural sources in order to current generation's access to maximum economic growth and income , sustainable development insists on supplying current generation's needs without jeopardizing next generation's facilities for supplying their needs. Policy making is impossible and unacceptable with no program that leads to starvation, poverty, social inequality and environment pollution at cities and villages and finally to ecologic devastation. In contrast, kind of development is acceptable that leads to continues improvement of life quality for all global society and next generations. Accessing to this goal is possible just through protecting natural sources and sustainable use of these sources.

Accessing to indigenous knowledge would enforce primary foundation of sustainable development. On the on hand, indigenous knowledge is production of empirical learning process and at the other hand is test and error of few thousand years of one society in relation to its environment. It is obvious that this knowledge represents human's interaction with nature and displays features of climate and specifications of vegetarian and animal nature of one region and more important , it displays their interactions with human(Kolawople, 2001).

By possessing this valuable information it is possible to predict its component relations , and it is possible to use of its latent power intelligently so that both balance be preserved and also human's needs be supplied.

At the other hand furthermore valuable latent information in indigenous knowledge, villager's epistemology would enforce relation between experts and local men. This issue is possible through deep analyzing of indigenous knowledge and familiarizing with local people's attitudes and epistemology and through that raft between men and experts would be restored. Everything is inter-related at village and intelligent rural people by considering accessible things in nature or easily is obtainable, would supply their needs (Box, 1999).

Broaching indigenous knowledge issue in order to presenting new approaches was reinforces in current decade which insists on human-oriented developing and sustaining. In this attitude, development process, environmental, social and cultural considerations, was considered important in addition to economic interests. Principle of sustainable development can be summarized so that development should be consistent with desired society from aspects of sustainable environment, fair social aspect, and from economic efficiency and cultural viewpoint. Considering people's indigenous knowledge was emphasized directly or indirectly as one of the development needs, at most of forty principles of sustainable development charter. Considering indigenous knowledge means accepting variation principle and describes that all people share and participate at variation and culture richness and they create common human's heritage. Sustainable development would not be able to be success without identifying people's indigenous knowledge, role and its position and also without protecting knowledge and indigenous people's rights, because indigenous knowledge has most consistency with principle of sustainable development (Karami and Moradi, 2003).

Necessity of attention to indigenous knowledge was appeared more due to failure of common development samples, especially at rural development, and being attracted to it to help formal knowledge was identified very critical. At the context of cooperative approach as new approach that is base on paradigms which forms concepts of development, focus on new revolution is emergence of new proficiency that is called indigenous knowledge. Cooperative approach is seeking to systematic use of indigenous knowledge at related researches to technologic actions.

According to different definitions of indigenous knowledge, it is possible to count it as part of unique culture of each ecosystem or country and that is knowledge and findings which obtained through experience in order to be consistent with certain ecosystem conditions, and changed as part of social and productive culture of that society over time. This acknowledges, represent compatibility methods with nature and establishing reasonable relationship between human and his environment. And has complete harmony with principle of sustainable development, form this viewpoint (Burger, 1997).

Compilation of Indigenous and modern knowledge:

Many experts believe that for making a sustainable development, Indigenous and modern knowledge should be combined. Nowadays, so much efforts have done to make use of Indigenous knowledge but main part of these efforts were done for derivation and making it scientific (Burger, 1997).

Amiri Ardakani and Shah vali (2003) believe that the undesirable outcomes of development on people and rural environment is the result of using new science by scientist, so by blending and making relation between modern and Indigenous knowledge we can solve this problem.

Millar believe that by combining Indigenous and modern knowledge we can make trust between researchers and rural people, because by using this way researchers and rural people know themselves as a partner that are responsible for a common process and product. Millar believe that the trust is the reason for future development (Penny, 2001).

Experts believe that there is no way to reach sustainable development except to combine Indigenous and modern knowledge.

Indigenous and modern knowledge will complicate when:

1- We solve structural barriers such as political, economical, cultural and social difficulties.

2- We correct the thoughts on educational systems by emphasizing on learning and thought process and also correct the thoughts on research systems by emphasizing on audience and beneficiaries needs.

3- We solve communication barriers that cause inactivity on relation process and steady and dynamic flow of knowledge between peasants, experts and scholars. (Emadi and Amiri Ardakani. 2004).

Nowadays, making scientific Indigenous knowledge in agriculture had devoted important part of Indigenous knowledge researches to itself. Creation forestry cultivation system which is taken from indigenous exploitation pattern in forested region is the result of making scientific Indigenous knowledge. Stimulus cultivation of fruit trees with other production was usual by farmers in developing countries from one hundred years before (Louise, 2000).

Environmental problems because of forest destruction, made scientist interested to use of forestry's methods and ways and forced them to make these ways scientific. Scientist had specified the physical and biological compatibility between different species and it is output according to laboratory studies and has identified compatible trees and productions. Then they supplied package sets by new title such as forestry cultivation, multi-cultivation and ecological agriculture systems and give them to farmers in commercial and formulated packages. Making Indigenous knowledge scientific is meaning to find its efficiency scientific reasons. In the process of making Indigenous knowledge scientific, most of the experts and researchers are not aware of cultural aspects of ways and Indigenous methods. If derivation of Indigenous knowledge and making it scientific was without attention to cultural aspects and governing values on indigenous society, it couldn't be acceptable among Indigenous people.

Experiences show that Indigenous people would not accept methods which are not compatible with their belief and needs even if it had had scientific bank roll (Emadi and Abbasi, 2001).

Reaching to sustainable development through Indigenous knowledge:

Dictated pattern's failure through western development countries to third world countries show that Indigenous knowledge is necessary to reach development.

Untrop believe that usage of local knowledge is efficient and useful in development and Indigenous knowledge's researchers believe that they achieved to an important source for innovation in agriculture methods and a good farming production to improve the rural people's life. On his idea, some of researchers call Indigenous knowledge as a good supplement and replacement for modern knowledge and they have tried to spread the usage of this knowledge all around the world. These plans as a "communion research with farmers" or "first is the first" are introduced. In this research method, private organs and local groups have the main role and unlink the current research plans, the tests are done with the farmers attendance in their farms and not in research centers and far from environment condition. The ways that farmers and rural people use for management of their living environment are the most scientific ways, although we couldn't understand it at the first sight (Chambers, 2000).

Eshraghi (2000) explained that by introducing sustainable development model or development environmental model and according to world food organization (FAO), sustainable development will create when applied technologies in rural development are in proportion with rural people's knowledge and also are acceptable by them. Also he says that one the main ways to reach sustainable development in society is that to have enough and necessary attention to the rural's Indigenous or local knowledge (Merrewij, 1998). It is also explained that attention to this knowledge needs a complete recognition of rural people and their knowledge that through assembling of this knowledge we can find a correct way to reach a sustainable development and we should know that the movement toward sustainable development is not possible without correct using of Indigenous knowledge. Many development experts believe that the Sustainability of this concept is at the studying of this knowledge and in becoming popular in development. Indeed, Indigenous knowledge with its holist features had known the relation between nature's components better and had smoothed the way to Sustainability of development (Gigler, 2003).

Results:

At sustainable human development, people are considered as "goal" of social and economic policies that their range of their selections would be extended in order to actively participate at decision making. Therefore, people's participation is one of tools of sustainable agriculture development. But active rural people's participation at extension programs as a form

of sustainable would not be possible unless by believing role of rural people's knowledge, vision and skills. Necessity and importance of indigenous knowledge and sustainable human development prepared field for establishing "united nation conference, about nature and development" at 1992. This conference was established due to complaints against damaging environment in order to prepare basis for active indigenous people's participation at legislation and policy making , how to manage sources and related activities to development ; and also if people presented some suggestions about recent subjects , so find way to practice them. Failure of moved technology to rural societies also manifested necessity of considering indigenous people and their knowledge. At the other hand, considering indigenous knowledge is essential to help formal knowledge; because indigenous expert's attendance beside other experts has very critical importance. For example, indigenous peoples know condition of their regional epistemology, very well. Thus, their attendance is very affective for extending incompatible technologies with condition of region and at least, it conceives propagators to test these innovations at small scales and under natural condition and helps to extend them at larger scales, after being ensured of their appropriateness.

Finally Indigenous knowledge as a constant structure, with many years experience could attain a deep understanding and insight of the environment and ecologic exchanges. This knowledge is conveyed to next generation and the next conveyed it to their children. Indigenous knowledge is on the verge of destruction like a curative prescription that has hidden a constant glamour on it. By dying each Indigenous person, the great treasury of knowledge will lay underground and these knowledge sources are destroying very speedily.

On the research which was done by Bozarjomhari (2004) with this title "analyzing Indigenous knowledge position on rural sustainable development". It was specified that although there are many differences between Indigenous and modern knowledge but they are not in contrast with each other, because they are each other's supplement and we can't be success when we use them separately. According to new parameters in rural development, for solving rural problems, at the first we should use of Indigenous solutions and if it was not efficient, we can use and test external solutions.

Research findings which was done by Emadi and Amiri (2004) with this title " compilation of Indigenous and modern knowledge is necessary for reaching agriculture sustainable development" signify that The believe of educated people to Indigenous people and their knowledge " precondition for making them close" is called combination and compilation. Making evolution in modern system for attention to tentative

knowledge is the main necessity for this compilation. Another necessity for this evolution is the researcher's attention to experimental accumulated wisdom and historical exploit by using qualitative and communion methods. Also applying compilation methods and making evolution among government, educational centers, farmers and peasant is the necessity and pre condition for combination of modern and Indigenous knowledge.

Research findings that was done by Karimi with this title " Indigenous knowledge in development process" signify that Indigenous knowledge was a essential element and important source for realization of sustainable development, poverty reduction, making local people capable and motivate them to participate in activities for agriculture and rural development, developing and product suitable technology, rural society's self-reliance and self sufficiency. For this reason all side's try, partnership and protection for record and registration, compatibility, distribution and promotion , exchange of this resources and also suitable and scientific guidelines for compilation of this knowledge with new knowledge and rural and agricultural development plans are needed.

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Characteristics of Online Education

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Abstract: Distance education dictates changes in behavior for both the teacher and the learner. The successful student develops persistence and skills in self-directing work. The successful distance education teacher becomes conversant with new technology and develops new instructional styles, moving from creating instruction to managing resources and students and disseminating views. Administrative and faculty support for distance education are critical to the success of this instructional method. Administrators should take note that the implementation of a distance education program may allow access to a greater number of students. However, the time and work associated with teaching at a distance exceeds the normal requirements of campus-based instruction. Students in distance education settings perform as well or better on assignments, class activities, and exams when compared to campus-based students .Nevertheless, students must maintain persistence and a clear focus to succeed in a distance learning situation. Self-direction, a passion for learning, and strong individual responsibility are important influences on achievement. There are indications that distance education works best for more mature, motivated, well-organized, and already accomplished learners.

Keywords: Online Education, Traditional Education

Introduction:

Massive wave of data produced in today's world it nicknamed the "information age" has all day and through various means of communication in the world will move on its size are added. Other hand, as we're not the world witnessed the development of the role of information communication devices transporting feedback fast and absorb the information around the world, we forget

Therefore, information and communication as the main lever or two important moves in developing wings, we learn. Meanwhile, proper utilization of the capacities of these two valuable and effective indexes in the general development concept for any society and the principles of a critical need is considered. With a view to clarifying this issue can be paid in the best way to create a platform for developing data standards and access to a knowledge based society, what really can be. To achieve a clear and practical answer in this area before all the existing definitions and indicators mentioned placed.

Distance education is education designed for learners who live at a distance from the teaching institution or education provider. It is the enrollment and study with an educational institution that provides organized, formal learning opportunities for students. Presented in a sequential and logical order, the instruction is offered wholly or primarily by distance study, through virtually any media. Historically, its predominant medium of instruction has been printed materials, although non-print media is becoming more and more popular. It may also incorporate or make use of videotapes, CD or DVD ROM's, audio recordings, facsimiles, telephone communications, and the Internet through e-mail and Web-based delivery systems. When each lesson or segment is completed, the student makes available to the school the assigned work for correction, grading, comment, and subject matter guidance by qualified instructors. Corrected assignments are returned to the student. This exchange fosters a personalized student-instructor relationship, which is the hallmark of distance education instruction.

Historically, most distance education courses were vocational in nature, but today courses are offered for academic, professional, and avocational purposes for students of all ages. There are numerous specialized programs, such as those for blind persons and for parents of small children with hearing impairments. Distance education is available in practically any field, from accounting to zoology. Courses are offered in gemology, high school diploma, journalism, locksmithing, child day care management, yacht design, and many fascinating subjects.

Distance education courses also vary greatly in scope, level, and length. Some have a few assignments and require only a few months to complete, while others have a hundred or more lesson assignments requiring three or four years of conscientious study. Since 1890, more than 130 million Americans have studied at DETC member institutions, including Franklin D. Roosevelt, Walter P. Chrysler, Walter Cronkite, Barry Goldwater, Charles Schulz, and many other distinguished alumni of DETC members.

Unlike most distance education courses offered by traditional colleges and universities that are semester and classroom oriented, with courses offered by most of the DETC-accredited institutions you can study any time and anywhere. Distance education is especially suited for busy people who wish to increase their knowledge and skills without giving up their jobs, leaving home, or losing income. You learn while you earn. Many courses provide complete vocational training; others prepare you for upgrading in your present job, without losing wages, experience or seniority. You receive individual attention, and you work at your own pace.

In recent years, technology has played a significant role in transforming the traditional distance education school into a dynamic, interactive distance learning method using toll-free telephone lines, as well as a diverse array of personal computers, video devices, CD and DVD ROMs, online courses over the Internet, interactive devices, and other modern technological innovations. The future for distance study promises to be exciting!

Benefits of Distance Learning:
Benefits and opportunities that distance education provides, include:
- training a wide range of audiences.
- meet the needs of students and students who can not attend in place.
- Possible connection between students and students with cultures, beliefs and experiences are different.
- Benefiting from coaches and speakers who do not live in the country.

Educational methods in distance learning:
Today, under the new system replaced the traditional systems of learning and learning week (ie tutoring methods, lectures) are:
- **Multimedia courses:**
These courses and widely used elements of image, communication, graphics and simulated components, animation and communication elements for guidance and tips, and talk back on course and curriculum issues are held.
- **Enhanced communication mechanisms:**
The mechanism of any texts simultaneously, and asynchronous audio-visual communications to protect you. This case allows students to practice on topics learned will give.
- **Written test:**
 thus, question and test via a distributed communication network, are corrected and returned. These exams through video conferencing support and runs**.**
-**Virtual Seminar:**
 thereby different groups of students in different

geographical environments linked together makes.
- **Collaborative virtual laboratories:**
 the laboratory of the Group's activities are supported. Workshops such as software engineering.
-**Smart academic factors:**
academic factors that inform intelligent, support and guidance students pay.

Remote educational tool:
distance learning tools and supplies various uses. These tools in four main courses are:
A - Audio Tools:
Audio tools include training such as two-way interactive telephone, video conference, shortwave radio and a strain of tools such as audio tape and radio.
 B - Image tools:
including slides, films, video tapes and video conferences.
C - Data:
computers as electronic data are sent and received. Because the data word description for a wide range of educational tools is used.
Computer applications for distance education are varied and include the following:
1- Training to Computer Management.
 2 - Computer Assisted Instruction.
3 - through PCs.
4 - e-mail, telegraph, computer conference and the World Wide Web simultaneously.
D - Print:
The main element of distance education programs, particularly in the exchange and delivery system information tools are considered.

Online Education Cons:
To balance our view of online education, let's consider some of the disadvantages/Weaknesses:
1. Requires Self Discipline
The greater freedom of online classes requires greater self disciplines, but not everybody has it. The comfort of studying from home may also reflect negatively on your motivation to do your best.
Depending on your personality, home can provide as many distractions as traditional campus facilities (designed especially for studying).
2. How well have you learned
With online education, the students have a greater hold on the education process, and that is not always a good sign. For example, in online education, though the teachers set up the audio and video clips with the same dedication, it remains to be seen whether the students study it with the same dedication that they would in a classroom.
3. No Campus Life
Many people remember the college/university as the best time of their lives.

Part of it is the campus life – During and after classes. One of the disadvantages of taking online education rather than traditional one, is that in online education you will not have the atmosphere of campus lawns, corridors and classrooms, huge libraries with real books you can hold. There will be no campus buddies and no campus culture.

4. Internet Connection
Another negative point of online education is that it entirely depends on the internet connection. Though many countries have a robust Internet connection and others are getting it soon, there are still countries, and areas in countries that do not have access to Internet and other enhanced technologies. It would be difficult to get online education in countries that have a limited online presence.

These are just some of the distinguishing points between online classes and traditional classes.

Online Education VS Traditional Education
This article reviews the differences and the pros and cons of online VS traditional education.

Gone is the world where only traditional, campus-based education existed and you only had to choose the university or college you wanted to study in.

Someday, probably in the near future, Online Education will replace traditional institutions. At least, many degree programs will combine the on campus courses as well as online classes as a standard educational approach.

But for now, the future student has to decide first whether he/she wants to study online or on a campus degree.

Here are some points to consider the pros and cons of online and traditional institutions:

Disadvantages of Online Education: Drawbacks to Consider
This article reviews the main disadvantages of the online education.

As online services in general are revolutionizing Internet activity and the business industry – Online Education is becoming increasingly popular.

It is not merely a new trend – for many people it is the only convenient way to acquire education. Online education already provides unique new opportunities which hadn't exist before.

The distance/online Education has not come to replace Traditional Education yet. The number of online universities and colleges is still relatively small and their services are not as well established as the services of traditional institutions.

Online Education – Disadvantages
The following are its 4 main drawbacks one would want to consider -

1. Human Interaction
Online classes means there is not live, face-to-face classroom and office interaction between students and teachers. For many this is highly significant. Consulting lecturers in person and being able to discuss matters in groups, in and outside the class is, for many, an important motivational activity and learning strategy. Moreover, for many programs interpersonal communication is crucial, but it is not easy to seriously practice online. Many people also prefer traditional campus-based education simply for the on-campus atmosphere and the opportunity to meet many people there face-to-face between and during class, conferences, campus parties, concerts, fairs, and various cultural events.

2. Study Materials
Online institutions provide all or much of their material online, which may be convenient, since you have to buy and photocopy less. But while online information in general is, of course, extensive, approved and trusted scholarly academic material is not easily to be found online.

The resources of online universities and colleges are not yet as extensive as those of traditional institutions with their on-campus libraries (and the private libraries of generous lecturers who will always lend you that hard-to-find book you absolutely must have for your paper).

3. No Lab Sessions
Degrees science, especially the natural sciences, require lab hours. Online education as yet cannot provide a substitute for actual hands-on experience that students find in the labs on campus.

Such experience is crucial in general, and it is often noted in particular by employees. One reason why graduates from traditional institutions are preferred is that they have extensive and relevant lab experience.

4. Difficulties of Self-Discipline
For many a significant advantage of traditional education is that it leaves little room for procrastination. You have to show up on campus and be in class, and for many this is a great motivational aspect and the reason for their eventual success. With online education the student has much more freedom. This can be both an advantage and a disadvantage. For many it is a disadvantage because it encourages procrastination. This leads either to unnecessarily prolonged studies or even failure to fulfill requirements, simply because there was too much freedom.

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Different methods in distance education

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Abstract: enjoying and giving publicity to any of technological tools with the aim to facilitate and accelerate the training process, as well as increase the quality and quantity of knowledge quality and knowledge of a serious intelligence community needs to integrate and standardize the educational system society. Hence, considering the position and role of education in the third millennium on the basis of ICT is also a serious approach to the topic with the knowledge community centered on learning and general trends of technological tools to enjoy much of the information and Find the appropriate place in the information society Third Millennium That actually can be a global community and is without limit is undeniable-and-run. Guidance and therefore move in the direction of society should be education and technology for comprehensive pandemic done. Considering the above definitions and with the knowledge and attitudes towards the third millennium and the desirability and some weaknesses in the achievement of certain standards and dynamic structures in order to achieve a knowledge based society, there is. In the present circumstances to provide our information infrastructure development and integration inevitably link the elements and tools that they are as indicators of technology education and technology education will be remembered. In the new context of combining these two indicators comes to training facilities and a variety of tools that will provide guidance and development in information will be very effective.
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Keywords: distance education, educational methods

Introduction:

If the scientific and cultural infrastructure with this technology's Day is not coordinated development of information will be obtained. This weakness caused by lack of growth and development of training required for pandemic knowledge of existing technology is. In many systems of scientific tools and capabilities needed to provide hardware and commissioning are still technological problems resulting from lack of knowledge of poverty and poor education in these centers to be seen.

In other words, the country still in the feasibility assessment and appropriate to make public the necessary training for operation and application of scientific principles and technological tools is has been done and why certain movements and sometimes non-normative point will not be able node an unlock.

The conditions and according to the capacity of developing countries and training facilities required a knowledge-based society feels is felt. If all processes in technology education and technology optimization and standardization of the Hungarian education should go, and appropriate channels that the best option in this area could benefit from state universities is capabilities.

According to the information in the development of any society should take half of the world to progress until the necessary coordination and synchronization global developments so as to accept the design structure of a knowledge-based society have a special place for the University and respect the role of education and technology was In designing a model with global

standards of dynamism and flexibility at first be necessary to select a sample that the facilities and communications needed for this purpose provide action and then determine optimal cognitive deficiencies than Hammett and weaknesses push.

No doubt the experiences of implementing these standards and to develop troubleshooting information using technological tools would be much more economical. That if we develop a range of information from a city university level and conduct more successful we'll be more acceptable was. Because the utilization and application tools and step up the information they've been successful. Therefore the most important first step needed to coordinate and synchronize technology education and educational technology standards and capability in the high user acceptability of the world is also enjoyed.

In the earlier days of distance learning, it was most common to see distance learning used for rural students who were at a distance from an educational institution. The student might watch a telecourse on a television stations, read texts, mail in assignments and then travel to the local college to take an exam. This model is still in use, but as the technology has become more sophisticated and the cost of distance learning dropped as equipment prices dropped, the use of distance education has increased. High front-end costs prevented an early widespread adoption of electronically mediated learning. Distance learning has been aggressively adopted in many areas because it can meet specific educational needs. As the concept of accountability

became accepted and laws required certain courses in high school in order for students to be admitted to state colleges, telecommunications was examined as a way to provide student access to the required courses. Many rural school districts could not afford the special teachers to conduct required courses. Distance education met this need by providing courses in schools where teachers were not available or were too costly to provide for a few students. It also fulfilled a need for teacher training and staff development in locations where experts and resources were difficult to obtain. These systems link learner communities with each other and bring a wide array of experts and information to the classroom.

Distance education is education designed for learners who live at a distance from the teaching institution or education provider. It is the enrollment and study with an educational institution that provides organized, formal learning opportunities for students. Presented in a sequential and logical order, the instruction is offered wholly or primarily by distance study, through virtually any media. Historically, its predominant medium of instruction has been printed materials, although non-print media is becoming more and more popular. It may also incorporate or make use of videotapes, CD or DVD ROM's, audio recordings, facsimiles, telephone communications, and the Internet through e-mail and Web-based delivery systems. When each lesson or segment is completed, the student makes available to the school the assigned work for correction, grading, comment, and subject matter guidance by qualified instructors. Corrected assignments are returned to the student. This exchange fosters a personalized student-instructor relationship, which is the hallmark of distance education instruction.

Historically, most distance education courses were vocational in nature, but today courses are offered for academic, professional, and avocational purposes for students of all ages. There are numerous specialized programs, such as those for blind persons and for parents of small children with hearing impairments. Distance education is available in practically any field, from accounting to zoology. Courses are offered in gemology, high school diploma, journalism, locksmithing, child day care management, yacht design, and many fascinating subjects. Distance education courses also vary greatly in scope, level, and length. Some have a few assignments and require only a few months to complete, while others have a hundred or more lesson assignments requiring three or four years of conscientious study.

Since 1890, more than 130 million Americans have studied at DETC member institutions, including Franklin D. Roosevelt, Walter P. Chrysler, Walter Cronkite, Barry Goldwater, Charles Schulz, and many other distinguished alumni of DETC members. Unlike most distance education courses offered by traditional colleges and universities that are semester and classroom oriented, with courses offered by most of the DETC-accredited institutions you can study any time and anywhere. Distance education is especially suited for busy people who wish to increase their knowledge and skills without giving up their jobs, leaving home, or losing income. You learn while you earn. Many courses provide complete vocational training; others prepare you for upgrading in your present job, without losing wages, experience or seniority. You receive individual attention, and you work at your own pace.

In recent years, technology has played a significant role in transforming the traditional distance education school into a dynamic, interactive distance learning method using toll-free telephone lines, as well as a diverse array of personal computers, video devices, CD and DVD ROMs, online courses over the Internet, interactive devices, and other modern technological innovations. The future for distance study promises to be exciting.

Key factors in the process of distance education:
the process of remote training, the following factors contribute:
- Students:
Regardless of educational content, role and main element in the learning process students are responsible.
- Coaches and Teachers:
Success depends on a lot of educational activities the ability, skills and knowledge are the coaches and professors.
- Facilitators of communication:
Facilitator bases, as the bridge between students and mentors are. Must base expectations of teachers and educational needs of students and service coordination and communication to create.
- Support staff:
One of the important pillars of any development of distance education programs, by development group finds. Operational support staff such as student registration, copy and distribute their resources, order textbooks, security and copyright, and are responsible for the report.
- Management:
The group decision makers, builders and judges are considered to be educational and should be considered among the factors above, establish the correct relationship formation.

In its original form, teachers using distance education traveled to remote sites and taught a class, or corresponded with students through mail, telephone, or fax machine. Individualized study has been a method of reaching the remote student for some time. Detailed course instructions are sent to the learner who performs

the assigned tasks and returns the completed work to the teacher for evaluation and reassignment if necessary.

Technology has raised the quality of individualized distance instruction. The use of various forms of electronic media increases time effectiveness and improves the delivery of information. Video, audio, and computer-based applications may enhance the product received by the independent learner. Electronic delivery can occur using synchronous communication, in which class members participate at the same time, or asynchronous communication where participants are separated by time (Romiszowski, 1993).

Video/audio models of distance education include broadcast television, cable television, satellite, microwave, fiber optics, and audio graphics. The most widely used format is broadcast and cable television (Parrott, 1995). However, developments in satellite and fiber optic systems have produced other successful programs. The interactive capability of many of these networks has produced a distance classroom that is nearly identical to a regular classroom. Teachers and students can interact through both two-way video and one-way video with two-way audio systems. The recent development of Desktop Video Conferencing (DVC) which brings interactive video capability to the desktop computer, further enhances learning opportunities.

The linking of computer technology through the use of the Internet or CD-ROM with television transmission provides a potentially new dimension to distance education. This technique can link university professors to high school teachers, or to physically disabled students, in a distance setting (McLean, 1996).

Another form of interaction is the use of computer conferencing. This method utilizes asynchronous communication in such forms as an e-mail list group, an Internet discussion group, or other types of conferencing software. Asynchronous methods of communication are especially appealing to the learner who has difficulty scheduling specific time- and place-bound course work.

Conclusion:

Technology transports information, not people. Distances between teachers and students are bridged with an array of familiar technology as well as new information age equipment. What sets today's distance education efforts apart from previous efforts is the possibility of an interactive capacity that provides learner and teacher with needed feedback, including the opportunity to dialogue, clarify, or assess. Advances in digital compression technology may greatly expand the number of channels that can be sent over any transmission medium, doubling or even tripling channel capacity. Technologies for learning at a distance are also enlarging our definition of how students learn, where they learn, and who teaches them. No one

technology is best for all situations and applications. Different technologies have different capabilities and limitations, and effective implementation will depend on matching technological capabilities to education needs.

Distance education places students and their instructors in separate locations using some form of technology to communicate and interact. The student may be located in the classroom, home, office or learning center. The instructor may be located in a media classroom, studio, office or home.

The student may receive information via satellite, microwave, or fiber optic cable, television (broadcast, cable or Instructional Television Fixed Services (ITFS), video cassette or disk, telephone - audio conferencing bridge or direct phone line, audio cassette, printed materials - text, study guide, or handout, computer - modem or floppy disk, and compressed video. Recent rapid development of technology has resulted in systems that are powerful, flexible, and increasingly affordable. The base of available information technology resources is increasing with dramatic speed. Much has been learned about connecting various forms of technology into systems, so that the ability to link systems is growing. Most distance learning systems are hybrids, combining several technologies, such as satellite, ITFS, microwave, cable, fiber optic, and computer connections.

Interactivity is accomplished via telephone (one-way video and two-way audio), two-way video or graphics interactivity, two-way computer hookups, two-way audio. Interactivity may be delayed but interaction provided by teacher telephone office hours when students can call or through time with on-site facilitators. Classes with large numbers of students have a limited amount of interactivity. Much of the activity on computer networks is on a delayed basis as well. Possibilities for audio and visual interaction are increasingly wide.

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High front-end costs prevented an early widespread adoption of electronically mediated learning. Distance learning has been aggressively adopted in many areas because it can meet specific educational needs. As the concept of accountability became accepted and laws required certain courses in high school in order for students to be admitted to state colleges,

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Information and Communication Technologies (ICT) in rural

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Abstract: Information communication technologies as itself do not change the social structure; the force for change is provided by the use of ICT in all spheres of everyday life activities. Information and knowledge we get by means of the Internet empower individuals to participate successfully in nowadays society's life. Thus unequal opportunities to use the Internet and other ICT are tightly related to an issue of social exclusion. In rural Internet and other information communication technologies (ICT) are mainly used by young, educated, well paid and urban consumers. Elderly, low-educated, low-paid and rural residents are among those who use the Internet the least. This great group consistent with men have had active role at areas of social-economic activities and always have had major part on economic production of society. ICT is now recognized as a technological tool which can serve as a catalytic intervention in respect of transforming the lives and livelihoods of rural families. The economic and income divides between urban and rural areas can be overcome only by the technological upgradation of rural professions. In our post-modern network society they are at the risk of social exclusion. This paper is aimed at the analysis of ICT diffusion in rural communities of Lithuania, exploring the main social patterns of diffusion and characteristics of rural Internet users. The study is based on focus group discussions and questionnaire-based survey of Lithuanian rural residents. The paper discusses types of change agents involved in the processes of ICT diffusion in rural communities and the main motives for using the Internet.

Introduction:

Technologies (ICT) during the past two decades have had many points of contact with education and training. The development of technology is placing new demands on expertise, and it is also leading to the increased use of information technology (IT) in instruction and learning. As early as in the 1970s discussions of the future of school systems started to pay attention to the opportunities provided by ICT. Now with the approach of the new millennium, IT is playing an increasingly central role in almost all future planning of schools and instruction. (World Bank, 1999).

With the help of state and local funding, information technology has been purchased for schools ever since the 1980s. The state has also found many ways to support teacher training in the use of IT, and it has also allocated funds for the production of IT programs.

Instruction in the use of IT has also played an important role in teacher training organized by local school authorities (Becker, 2000).

There are two opposite perspectives on the role of ICT in society. One part of scholars views computers and the Internet as magic entities with the power to transform society. They consider the Internet as a new medium of communication, helping to cope with issues of social exclusion, social inequality. According to Manuel Castells (2002: xxxi), this is one of the reasons "why, after three decades of existence, it emerged from specialized communities in the world of researchers, techies, hackers, and countercultural communities, to catch fire in business and in society at large".

ICT in rural:

The first group implies theories which explain the patterns of innovation diffusion in relation to communication flows. The diffusion research focuses on adoption by individuals (or by single organizations) and investigates the impact of such factors as the nature of innovation, characteristics of adopters, diffusion networks and other. (Attewell 1996, Harper 1989).

The most widespread theory of innovation diffusion is presented by Everett Rogers. According to this theory, diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers 1983:5), thus the main 4 elements, which are identifiable in every diffusion research study, are (1) an innovation, (2) communication through certain channels, (3) time and (4) members of social system.

The first element – innovation - is considered to be any idea, practice, or material artifact perceived to be new by the adopting organization or individual (Rogers 1983). In our case, we analyse ICT communication through certain channels among the members of rural communities.

The potential adopters can find about new ideas just

in case they are informed about them, thus the diffusion process implies the second element - communication through certain channels. According to Rogers (1983), innovations such as ICT can be transmitted to the receiver using 2 types of communication channels: (1) interpersonal channels, and (2) mass media channels.

First type implies direct (e.g. face-to-face) communication between transmitter and receiver; and the second type includes governmental policies communicated through TV, radio, newspapers, etc. This existing discourse makes an impact on beliefs and attitudes of people toward ICT use and is one of the means for ICT diffusion among society members.

The second group of theories - macro-diffusion theories – examines the diffusion of new technologies across entire populations, communities, society. Speed of adoption depends on such factors as population size of an area, the distance o that area from other centers of population (Attewell 1996:205).

John Carey (1996) distinguishes marketplace factors as a separate group in diffusion research. This group includes pricing policy, replacement cycles. The price of innovation (new product, technology, service, etc.) has an important role in the process of adoption by the public. Generally new products are introduced at a high price, as early manufacturing is more expensive (due to the costs associated with the research and development of the product, low scale of production). As John Carey (1996) argues: a new technology has to find some early users who are able and willing to pay a high price for the product or service in order to achieve the economies of scale in manufacturing that can reduce the price for the general public.

The mass production reduces the costs and the price of the product. Typical examples of such pricing policy are introduction of radio, black white and color TVs, telephone connection. The initial price of the new technology was very expensive for an average household and the technology was not widely used, but the decrease in price resulted in a wider adoption.

But, as John Carey (1996) argues, the personal computer has followed a different pricing pattern: "rather than drop the price of personal computers, manufacturers have increased the capabilities of PCs each year". Replacement cycles are also important. The growth of some technologies is linked to the purchase of other media. In this sense, replacement cycles for existing media can provide an important way to introduce new media. For example, in U.S. households, the average color TV is replaced after 8 years, the average telephone answering machine after 5 years and the average personal computer after 6 years (Carey 1996).

Information technology is the core element analyzing the new, global, knowledge-based society. In today's world the use of ICT becomes one of the most influential factors that determine both the present performance and the future conditions for the person. The Internet offers a variety of ways for interaction. Lelia Green (2001:197) distinguishes 3 ways of interaction: (1) information access and retrieval, (2) private interactive

communication with individuals or small groups and (3) public interactions. But unequal opportunities to use the Internet eliminate this variety of interaction. When we talk about the impact of new information communication technologies on the society, we analyze mainly two aspects of impact– networked or socially excluded people.

Contemporary scientists have formulated the terms like information poor and information rich (Green 2001). An approach like this emphasizes the circumstances of people with access to minimal or large amounts of information. People who do not have or have limited access to information resources (non-haves of information or information poor) are in the social position lower than information rich. The policies based on the idea of fundamental equity are that all people should have "trouble-free access to information" and this will promote equality (Green 2001:105).

Of course, not everything depends on the access: "Access to technology does not necessarily lead to its use, and information does not necessarily fuel self-empowering activity" (Green 2001:105). As Lelia Green argues: access is a necessary, but by no means sufficient, condition of equitable participation. To talk simply in terms of equity of access ignores the fact that effective interaction in the information society requires high levels of motivation and sustained effort. Such keenness to interact with the technology of information cannot be assumed. Continuing motivation is perhaps the key determinant of successful participation – more important than access per se (Green 2001: 104). The diffusion of ICT and adoption in everyday life activities such as e-learning, ecommerce, e-banking, etc. are rather complicated phenomena, depending on various characteristics of an individual and a certain social system.

Considering the use of the Internet, it is obvious that socio-demographic characteristics determine a gap between different groups of the population. According to the data of a survey Digital Lithuania 2001, performed in the framework of a study Lithuanian Information Society, carried out by The Open Society Fund (Šaulauskas, 2001), the Internet and other information technologies are mainly used by young, educated, well paid and urban consumers. The statistical data of this survey showed that people at the age of 15 – 49, who have acquired higher education or live, or aim at living in Vilnius, Kaunas and other major cities of the country, and have high income are the most involved in the processes of information society development

(Šaulauskas, 2001).

According to the statistical data, the lowest awareness of the processes and opportunities of information society development is among the Lithuanians over 60, who have acquired secondary or special secondary education, live in villages, rural centres or towns and have rather low income (Šaulauskas, 2001). It is obvious that different socio-demographic characteristics have determined a gap between different groups of the population. This can lead to the information gap, when one part of the population uses digital devices, while the other part of the population is in a digital divide. Thus the residents of rural communities are at the risk of being in a digital divide or even in a social exclusion.

Conclusions

Public access is emphasised as one of the ways in making the Internet available to greater numbers of individuals and firms in rural regions of Lithuania. Statistical data show that socially excluded groups (retired, elderly and unemployed people) use the Internet very little or do not use it at all. This case study also suggests that the methodology of the pilot study should be revised, because it is quite complicated to answer the question about the impact of ICT on social exclusion. Data show that people consider that there is a threat of social exclusion of some groups (ICT non-users) in Lithuania. But they are also positive about the role of the Internet in solving problems of exclusion. The use of the Internet is considered as an effective mean to integrate socially excluded people into society's life, because living in rural region is not the key issue for being excluded.

A common strategy in higher education ministries in developing countries is public and private sector partnership in strategy or pursue rapid ICT projects is based. This partnership has different forms such as grant aid private sector interaction with public assistance, donated educational equipment and components by companies to public schools, providing technical assistance for planning, management and consolidation tools and human resources at the local level. But after financial aid, testing programs based on ICT is critical.

Many of the ICT training programs based on the charitable agencies aid have been unable to have high durability. Because the government has failed in its financial assistance in this situation none of the local communities to provide resources do not needed to continue these programs. Two strategies in here "to support government and local communities to move" are important. Since the 21st century, is century of education support about youth in Asia, to find sustainable ways to bridge the digital age in Asian countries is a real priority. And work through partnership that local leaders and guides are experts it

can be lasting forever.

Several recommendations that emerged from the discussions emphasized on the need to think of ICT in education beyond computer aided learning and investigate the potential other technologies like community radio and other medium. These mediums could not only be cost effective but also has a greater outreach potential. It was also pointed out that low cost software solutions for e-learning that have scopes for innovation, should be incorporated in large scale projects. With an indication to open source solutions, the sessions recommended that such solutions should become a part of the overall policy for implementating technology supported education interventions.

Sustainability and scalability of project are also issues that needed serious considerations. While moving beyond the pilot and experimental phase, projects especially those that needs a considerable financial contribution should have a viable sustainability model for up scaling. It was also recommended that implementers needs to be cautious when selecting areas for implementing ICT in education projects.

Projects should also not lose priority of the education objectives. In some cases ensuring school accountability system and teachers attendance may be more important that investing time and resources in ICT integration in schools. One fact that emerged in the sessions was that ICTs effectively computers, initiated in government department and schools were being used as decision support in education. Essentially, clear criteria, norms and standards needs to be developed for the information that was being used for decision-making.

This paper is a multidisciplinary study of ICT initiatives for rural development. It emphasizes adoption of a more systematic approach for integrating Traditional Knowledge Systems (TKS) and ICT inputs to ensure sustainability of rural e-governance projects. The study of literature related to rural development and e-governance has indicated various issues impeding success of such initiatives. The main issues are lack of localization of content for rural communities and inadequate participation of rural communities in design of rural ICT initiatives. The study therefore suggests the use the systems-approach to integrate the relevant TKS along with ICT initiatives in the design of e-governance systems for rural development. This participatory approach can lead to creation of more acceptable and sustainable e-governance projects.

Regardless of the wide differences in ICT access between rich and poor countries and between different groups in the country, there are concerns that challenge the application of ICT in education with the existing differences among the lines of economic, social, cultural, geographic and gender will be broader.

Everyone equal opportunities in terms of suitability for participation are necessary, but access to various factors, either as users or as producers through their sources is difficult and heavy. Therefore, the primary differences enhance and even grow. Consequently, programmers' international education is faced with a difficult challenge and how to help solve the problem and its development.

Promoting ICT in education, when done without careful study, can lead to the marginalization of those with more favorable conditions are unknown. For example, "women compared with men, because of illiteracy, lack of higher education, lack of time and mobility and poverty, controlling access to ICT and fewer opportunities for training are relevant. Also, more boys than girls' access to computers at home and school are not strange to say that if more boys than girls are willing to work with computers. The report of the University Association of American Women is that "Although some girls have an important gender gap have been limited, but today's technology, technology club, and boys in public schools while its own problems and programs are settled girls use computers for word processing the brand"**.**

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SERUM TRACE METAL LEVELS IN DIABETIC PATIENTS ATTENDING A TETIARY HEALTH CENTRE IN NIGERIA

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ABSTRACT: The clinical significance of trace element evaluation with regards to diabetes mellitus have been increasingly recognised. Hence, the need to assess trace element levels in diabetic patients. In this study, the plasma levels of chromium, magnesium, zinc, manganese, copper and selenium were determined in 85 subjects which includes 45 previously diagnosed diabetic patients and 40 apparently healthy non-diabetic control subjects. Samples were analysed using atomic absorption spectrophotometric methods. Plasma concentration of magnesium (11.64±0.96mg/L), zinc (12.0±9.18µg/dl), chromium (65.42±5.44µg/L) and selenium (62.22±7.62µg/L) were significantly decreased (P<0.05) in patients with diabetic mellitus when compared with control. Conclusively diabetic mellitus is associated with a significant decrease in serum trace element levels, this is consistent with the findings of other researchers. [Idonije B.O, Okogun G.R.A, Iribhogbe O.I, Ekhator C.N, Tijani T.T, Salimon A.Z and Omonrogieva O. Serum Trace Metal Levels in Diabetic Patients Attending a Tertiary Health Centre in Nigeria. Academia Arena. 2011;3(7):28-31] (ISSN 1553-992X). http://www.sciencepub.net.

Key Words: Trace Elements, Diabetes Mellitus, Antioxidants, Hypomagnesemia

INTRODUCTION

Diabetes mellitus is a syndrome of disordered metabolism, usually due to a combination of heriditary and enviromental causes, resulting in abnormally high blood glucose levels (Walker et al., 2000 ; Tierney et al., 2002). This is due to a defect in either insulin secretion or insulin action in the body (Niel et al., 2000 ; Wild et al., 2004 ; Rother, 2007).

Blood glucose levels are controlled by a complex interaction of multiple chemicals and hormones in the body, including the hormone insulin made in the beta-cells of pancreas. Diabetes develops due to a diminished production of insulin in (type 1 diabetes) or resistance to its effects in (type 11 and gestational diabetes). This results in hyperglycemia which ultimately cause the acute signs of diabetes; excessive urine production, a resultant compensatory thirst and increased fluid intake, blurred vision, unexplained weight loss, lethargy and changes in energy metabolism (WHO, 1999; Walker et al., 2000).

Trace elements are inorganic molecules that are essential for life (Tiffany, 2001). They occur in human and animal tissues in milligram per kilogramm amount or less. Intake requirement of trace element per human are reported in milligram per day. Essential trace metal such as chromium, magnesium, selenium, cadmium and cobalt are essential for optimal growth, development and reproduction. However, all essential trace elements become toxic when their concentration become excessive. Usually this happens when their level exceed 40-200 fold those required for correct nutritional response. There is accumulating evidence that the metabolism of essential trace element is altered in diabetes mellitus. Hypomagnesemia might increase the risk of ischemic heart disease and cause severe retinopathy. Chromium increases tissue sensitivity to insulin and elevate high density lipoprotein (HDL) cholesterol and low desity lipoprotein (LDL) cholesterol ratio (Walker et al., 2000). Selenium is involved in processes which protect the cell against oxidative damage by peroxides produced from lipid metabolism.

MATERIALS AND METHODS

Sample Area and Population

This study was carried out in Irrua Specialist Teaching Hospital (ISTH), Irrua, in the outskirt of Ekpoma, Esan West Local Government Area of Edo State. Ekpoma is a semiurban community located at latitude 6.75^0N and longitude 6.13^0E with a populationof 61,870 (Population Census, 2007).

Study Subjects

A total of 85 subjects consisting of 45 already diagnosed DM patients attending the outpatient clinic of Irrua Specialist Teaching Hospital and 40 apparently healthy volunteers (control group). Ethical clearance was obtained from an ethical review board and appropriate informed consent was obtained from the participants. The recruited participants were appropriately age and sex matched.

Sample Collection/Analysis

Blood samples (5mls) were collected by venepuncture into a plain container. The samples were spun in a bucket centrifuge at a speed of 2500rps to separate serum from red cells. Serum trace elements (copper, zinc, chromium, magnesium and selenium) levels were determined by atomic absorption spectrophotometer technique as described before.

Data Analysis

Data obtained was analyzed using SPSS version 17 statistical soft ware package. Results were expressed as mean ± SD and a P value of <0.05 was considered significant.

RESULTS

The mean serum chromium, magnesium, zinc, copper and selenium levels were lower in diabetic patients (65.42±5.44 µg/L, 11.64±0.96 mg/L, 12.0±9.18 µg/dl, 68.73±2.86 µg/L and

62.22±7.62 µg/L respectively) when compared with control (Table 1). This however, was statistically significant for Mg, Zn and Se (P<0.05). Among male diabetics, a similar statistically significant reduction (P<0.05) in trace element (Mg, Zn and Se) levels was noted (Table 2); this however, was not the case with serum manganese concentration (69.25±0.97 µg/dl) which was more significantly elevated (P<0.05) in diabetic patients when compared with male control (63.83±4.26 µg/dl). These findings were however, different in diabetic females. Serum Cr, Mg and Se levels were significantly reduced (P>0.05) in female diabetics when compared with apparently healthy female control (Table 3). The serum manganese level in diabetic females (66.24±3.62 µg/dl) was not significantly different (P>0.05) from male diabetics (69.25±0.97 µg/dl) and apparently healthy female control. This reveals the fact that serum trace element levels in diabetics may be sex dependent.

Table 1: Serum Trace Element Levels in the Study Participants

Trace Metals	Diabetic Patients N = 45	Control N = 40
Cr (µg/L)	65.42±5.44	68.03±4.01
Mg (mg/L)	11.64±0.96*	12.46±0.90
Zn (µg/dl)	12.0±9.18*	12.76±9.67
Mn (µg/dl)	67.04±3.40	65.03±4.36
Cu (µg/L)	68.73±2.86	69.30±3.47
Se (µg/L)	62.22±7.62*	68.85±3.45

Values are expressed as Mean ± SD, *P<0.05 is considered significant.

Table 2: Mean Serum Trace Element Levels in Male Diabetic Patients

Trace Metals	Diabetic Males N = 25	Healthy male control N = 20
Cr (µg/L)	65.42±6.54	67.83±4.49
Mg (mg/L)	11.71±0.87*	12.48±0.61
Zn (µg/dl)	118.17±7.81*	129.94±10.22
Mn (µg/dl)	69.25±0.97*	63.83±4.26
Cu (µg/L)	68.25±2.70	68.44±4.06
Se (µg/L)	61.92±7.61*	69.22±3.51

Values are expressed as Mean ± SD, *P<0.05 is considered significant.

Table 3: Mean Serum Trace Element Levels in Female Diabetic Patients

Trace Metals	Diabetic Females N = 20	Healthy Female control N = 20
Cr (μg/L)	65.42±5.10*	69.41±3.29
Mg (mg/L)	11.61±1.01*	13.22±0.64
Zn (μg/dl)	120.85±9.64	125.64±8.97
Mn (μg/dl)	66.24±3.62	66.00±4.29
Cu (μg/L)	68.91±2.93	70.00±2.80
Se (μg/L)	62.33±7.73*	71.09±2.14

Values are expressed as Mean ± SD, *P<0.05 is considered significant.

DISCUSSION

Trace elements are uniquely required for growth and maintenance of Life and Health. Lack of adequate supply produces nutritional impairment which may result in disease. In this study it was observed that serum Mg, Zn and Se levels were significantly decreased in patients with diabetes mellitus while the serum Mn level was more elevated in diabetic patients when compared with apparently healthy control. This observation is in agreement with the study of Retuam and Bhanderkar, (2009), Scott and Fischer (1938) and Tuvemo, (1990). Also from the study, serum Mg, Zn and Se were significantly decreased in male diabetic patients, with a significant increase in manganese levels. This finding corroborates the finding of Seeling and Heggtueit, (1974). From our study, it was observed that Mg, Se and Cr were significantly decreased in female diabetic patients while the serum levels of Mn, Cu and Zn though decreased were not statistically different from apparently healthy female control. This suggests that the serum trace element levels may be sex dependent. This observation was in agreement with the study of Rabinowitz et al., (1980) and Tuvemo, (1990).

CONCLUSION

Conclusively, this study revealed that the level of Mg, Zn, Se and Cr were significantly reduced in diabetic patients; this may contribute to the complications of diabetic mellitus due to added metabolic alterations that may result from this. Hence we suggest that these trace elements should be incorporated as adjuvants in the dietary management of diabetic mellitus.

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Implications of Lesson Plans in Adult education

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Abstract: In traditional programs that the principles of psychology and curriculum planning, less attention is the form of content presentation ie codification and providing books, original format and have the dominant form, while for adult content that could have valuable experience in addition to writing, other ways also be provided Affect the selection of pictures and images related to the concepts and content produced by including them. Learning activities such as activities outside the classroom, dialogue, role playing and ... Another type of content is presented. Duties are placed on the learner, a resource for developing knowledge, skills and insights he considered. Curriculum content only from the training provided to learners or not, but put together their learning through activities that can inform or does, skills and attitude to achieve. In this case, apart from learning that the assays taught learners directly to sustainable and effective learning occurs in his.

Introduction:

Adult illiteracy is like a disease that infects virtually every dimension of Kentucky life. Adult illiteracy saps the energy and capability of Kentucky's people and its economy. Adult illiteracy feeds the state's unemployment, its welfare rolls, and the correctional institutions. Adult illiteracy severely hinders the life chances of young children, undermines school reform, and limits the opportunities for postsecondary education. Despite landmark reforms in public schools, too many Kentuckians continue to drop out of school, The field of adult education and literacy is plagued by confusion about definitions. Over the years definitions have evolved from provisions in federal law and initiatives of groups advocating particular methodologies or the needs of specific adult populations. The result is that definitions tend to merge statements about the goals to be achieved (e.g., improving the literacy of a particular population) with a particular means (e.g., adult basic education) to achieve the goal.

Educational materials on adult education with daily life, needs, goals, aspirations and past experiences of adults and their relationship helps to results learned in life and career are used.

Lesson Plans for Adults:

Lesson plans for adult education don't have to be difficult. Follow these easy steps and see how effective you can be. Every good course design begins with a needs assessment. For our purposes here, we're going to assume you've completed this assessment and you understand what your students need and what your objectives are for the course you're designing. If you don't know your objectives, you're not ready to design

your course. With your objectives in hand, course design can be easy. Like any gathering of people for any reason, it's good to begin at the beginning and address who is there, why they've gathered, what they hope to accomplish, and how they'll accomplish it.

Welcome and Introduction:

Build in 30 to 60 minutes at the opening of your class to conduct introductions and review your objectives and agenda. Your beginning will look something like this:

1. Greet participants as they arrive.
2. Introduce yourself and ask participants to do the same, giving their name and sharing what they expect to learn from the class. This is a good time to include an ice breaker that loosens people up and makes them feel comfortable sharing.
3. Write their expectations on a flip chart or white board.
4. State the objectives of the course, explaining why certain expectations on the list either will or won't be met.
5. Review the agenda.
6. Review housekeeping items: where the restrooms are, when the scheduled breaks are, that people are responsible for themselves and should take a restroom break early if they need one. Remember, you're teaching adults.

Module Design:

Divide your material into 50-minute modules. Each module will contain a warm-up, a short lecture or presentation, an activity, and a debriefing, followed by a break. At the top of each page in your teacher's guide, note the time needed for each section and the

corresponding page in the student's workbook.

Warm-Up:

Warm-ups are short exercises (5 minutes or shorter) that get people thinking about the topic you are about to cover. It can be a game or simply a question. Self-assessments make good warm-ups. So do ice breakers.

For example, if you're teaching learning styles, a learning-style assessment would be a perfect warm-up.

Lecture:

Keep your lecture to 20 minutes or less if possible. Present your information in full, but remember that adults generally stop retaining information after about 20 minutes. They will listen with understanding for 90 minutes, but with retention for only 20.

If you're preparing a participant/student workbook, include a copy of the primary learning points of your lecture, and any slides you're planning to use. It's good for students to take notes, but if they have to furiously write *everything,* down, you're going to lose them.

Activity:

Design an activity that gives your students an opportunity to practice what they just learned. Activities that involve breaking into small groups to complete a task or to discuss an issue are good ways to keep adults engaged and moving. It is also a perfect opportunity for them to share the life experience and wisdom they bring to the classroom. Be sure to build in opportunities to take advantage of this wealth of relevant information.

Activities can be personal assessments or reflections that are worked on quietly and independently; they can be games or role playing; or they can be small group discussions. Choose your activity based on the best way to provide the adults in your class with an opportunity to experience what you just taught.

Debriefing:

After an activity, it's important to bring the group back together and have a general discussion about what was learned during the activity. Ask for volunteers to share reactions. Ask for questions. This is your chance to make sure the material was understood. Allow for 5 minutes. It doesn't take long unless you discover that learning hasn't happened.

Evaluation:

End your courses with a *short* evaluation to determine whether or not your students found the learning valuable. Emphasis on the short. If your eval is too long, students won't take the time to complete it. Ask a few important questions:

1. Were your expectations of this course met?

2. What would you have liked to learn that you didn't?
3. What was the most helpful thing you learned?
4. Would you recommend this class to a friend?
5. Please share comments about any aspect of the day.

This is just an example. Choose questions that are relevant to your topic. You're looking for answers that will help you improve your course in the future.

Conclusion:

Learning activities such as activities outside the classroom, dialogue, role playing and ... Another type of content is presented. Duties are placed on the learner, a resource for developing knowledge, skills and insights he considered.

Curriculum content only from the training provided to learners or not, but put together their learning through activities that can inform or does, skills and attitude to achieve. In this case, apart from learning that the assays taught learners directly to sustainable and effective learning occurs in his.

Another way of providing content that is educational activities outside the learning environment possible for learning more and better enables adult learners. For example, hits, field trip experiences for learners or transfer is provided, develop knowledge, insight and skills they will.

To ensure that science curriculum and educational aspects, according to community needs and audiences, application form is provided or not, the content selection criteria should be considered. These criteria is being include knowledge, effectiveness, flexibility, diversity, relevance and practical learning.

Some research findings that can be a learning process for the Guidelines for training operations are applied, is given below:

1- To maximize learning, information must be provided an organized manner. Entries can be simple or complex can be arranged around related concepts are organized. Starting point for organizing content knowledge for adults and adults is linked to past experiences

2- Learning, especially regarding skills development, will be added frequently.

3 - Duties and meaningful content than meaningless subjects are learned more easily and are later forgotten. This issue, especially for older adult learners is true. Challenges of adult learning facilitators by the way that content was significantly associated with the experiences and needs of learners is.

4- Passive than active participation in learning activities, learning increases. Adult educators

are allowed to participate actively in India, a stable and meaningful learning to help

5- Environmental factors affect the learning. Tangible things such as noise, crowded places, temperature, light and ... Learning process can be prevented. Other factors such as stress, ridicule, pressure, fatigue and low health can also reduce learning.

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Online Learning: Benefits and Requirements

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Abstract: Emergence and development of information societies is the consequences of industrialization. Despite the diversity of information in various forms of media in local, national and international, access, exchange and use of various information easier than last time is. Information society, a member of your buddies know that open information system in terms of geographical location and the last 25 years, organizational development, are limited. Distance learning faster than other forms of training has been. Growth factor in the economic interests of this type of educational approach, flexibility and remove the distance can be named. The methods of distance education, required for building physical education is not providing services. Teachers and trainers in this method - compared with traditional methods - and have more opportunities to more people than are being trained. In this type of teaching style of each person in each academic field, and each job can be arbitrary in time and space, trained without having to leave the house for work or business is education. This method requires that students are dispersed over long distances provides. Distance learning advantages of distance education in comparison with traditional education, the need for physical locations and training programs limited to no specific time period. In this type of teaching style, learning for life without possibility of spatial and temporal constraints for each individual there. In distance education, problems related to lack of qualified teachers and appropriate educational environment - as it posed in the traditional method of M is - is resolved. In this way the use of advanced features in digital libraries and search the various sites during the study, time and cost savings.
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Introduction:

Trainers using new technologies were successful educational programs to millions seek learning opportunities and thereby reach out to the educational spaces, training centers to expand. With the development of long-distance telephone system in the early twentieth century method of capacity and distance learning methods for students to access educational opportunities in the world increased Translation. But until the invention of mobile tele conference ever in the 80 and 90 and the main role in the concept of distance education did not play. Telemetry system, allowing for teachers conference provided that without the slightest delay at a time when your students can listen to them talk and sometimes they see.

Expansion of computer networks in the decade 1990 and connect millions of people through lines to the telephone networks made it possible to simply distance learning via computers and computer conferences around the world is possible (a) and Today with the development of control technology in science and technology around the world are.

in distance education teachers often are separate and comprehensive. Preparation of educational materials, supporting learners under the supervision of a training center takes place almost never do as a group are not**.** For services to education and electronic learning aids such as printed materials, computers and the Internet rely on.

Another look at the educational system of a new e-business and artistic and is a comprehensive solution to the institutions that want to move in the direction that technology and change their teaching methods and environments are possible to achieve the new educational approach provides**.**

Key factors in the process of distance education:

The process of remote training, the following factors contribute:
- Students:

Regardless of educational content, role and main element in the learning process students are responsible.
- Coaches and Teachers:

Success depends on a lot of educational activities the ability, skills and knowledge are the coaches and professors.
- Facilitators of communication:

Facilitator bases, as the bridge between students and mentors are. Must base expectations of teachers and educational needs of students and service coordination and communication to create.
- Support staff:

One of the important pillars of any development of distance education programs, by development group finds. Operational support staff such as student

registration, copy and distribute their resources, order textbooks, security and copyright, and are responsible for the report.
-    Management:
 The group decision makers, builders and judges are considered to be educational and should be considered among the factors above, establish the correct relationship formation.

Benefits of Distance Learning:
      Benefits and opportunities that distance education provides, include:
 - training a wide range of audiences.
 - meet the needs of students and students who can not attend in place.
 - Possible connection between students and students with cultures, beliefs and experiences are different.
- Benefiting from coaches and speakers who do not live in the country.

How Online Learning Works?
      The principle simple: Online Learning works like traditional education, but happens entirely online.
Lectures are viewed on the screen of a computer, with written supplementary material, lecture transcripts, and academic sources provided electronically.
      There is email and forum communication between classmates and teachers, as well as video meetings.
      Exams are taken online, assignments are submitted electronically (uploaded or sent by email). Some institutions still require exams to be taken in special learning centers, but this is most likely to change over time to total virtual education experience.

What Online Learning can offer?
* Students no longer need to work in snatches during summer vacations, they can combine more easily then ever before full time jobs and studies
* Students do not need to commute, saving great amounts of time, money, and personal energy, as well as global energy.

This seems very simple, and it is, but its implications are, again, enormous. It means much more time spent on actual education and personal life. It means money saved. It even means significantly less traffic and green house gasses.
It also means students:
* Construct their own schedules
* Can finish four-year programs in two years

Online classes means there is not live, face-to-face classroom and office interaction between students and teachers. For many this is highly significant. Consulting lecturers in person and being able to discuss matters in groups, in and outside the class is, for many, an important motivational activity and learning strategy.
      Moreover, for many programs interpersonal communication is crucial, but it is not easy to seriously practice online.
      Many people also prefer traditional campus-based education simply for the on-campus atmosphere and the opportunity to meet many people there face-to-face between and during class, conferences, campus parties, concerts, fairs, and various cultural events.
       Online institutions provide all or much of their material online, which may be convenient, since you have to buy and photocopy less. But while online information in general is, of course, extensive, approved and trusted scholarly academic material is not easily to be found online.
       The resources of online universities and colleges are not yet as extensive as those of traditional institutions with their on-campus libraries (and the private libraries of generous lecturers who will always lend you that hard-to-find book you absolutely must have for your paper).
       Degrees science, especially the natural sciences, require lab hours. Online education as yet cannot provide a substitute for actual hands-on experience that students find in the labs on campus.
Such experience is crucial in general, and it is often noted in particular by employees. One reason why graduates from traditional institutions are preferred is that they have extensive and relevant lab experience.
      For many a significant advantage of traditional education is that it leaves little room for procrastination. You have to show up on campus and be in class, and for many this is a great motivational aspect and the reason for their eventual success.
      With online education the student has much more freedom. This can be both an advantage and a disadvantage. For many it is a disadvantage because it encourages procrastination. This leads either to unnecessarily prolonged studies or even failure to fulfill requirements, simply because there was too much freedom.

Conclusion:
      Each method is mentioned with regard to changes in features and creates an education system, and evaluation is used. Judgment of distance education in an educational way, first as a necessity to eliminate barriers to educational climate and geographical areas, age and gender restrictions learners began their work And more in a death education system, especially in the philosophy and goals based on theories of learning theories have evolved to find and promote professional growth. Approach to distance education with regard to the necessity of education in countries formed.
      Emergence and development of information

societies is the consequences of industrialization. Despite the diversity of information in various forms of media in local, national and international, access, exchange and use of various information easier than last time is. Information society, a member of your buddies know that open information system in terms of geographical location and the last 25 years, organizational development, are limited. Distance learning faster than other forms of training has been.

Growth factor in the economic interests of this type of educational approach, flexibility and remove the distance can be named. The methods of distance education, required for building physical education is not providing services. Teachers and trainers in this method - compared with traditional methods - and have more opportunities to more people than are being trained. In this type of teaching style of each person in each academic field, and each job can be arbitrary in time and space, trained without having to leave the house for work or business is education. This method requires that students are dispersed over long distances provides. Distance learning advantages of distance education in comparison with traditional education, the need for physical locations and training programs limited to no specific time period. In this type of teaching style, learning for life without possibility of spatial and temporal constraints for each individual there. In distance education, problems related to lack of qualified teachers and appropriate educational environment - as it posed in the traditional method of M is - is resolved. In this way the use of advanced features in digital libraries and search the various sites during the study, time and cost savings are.

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Using of Distance education in adult education

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Abstract: Adult illiteracy severely hinders the life chances of young children, undermines school reform, and limits the opportunities for postsecondary education. Despite landmark reforms in public schools, too many Kentuckians continue to drop out of school, thereby perpetuating the chronic problem of adult illiteracy. Too many young Kentucky parents are unable to read and lack the basic literacy necessary to provide the necessary stimulating, supportive family environments for young children. It is known that children's literacy levels are strongly linked to the educational level of their parents and that children of parents who are unemployed and have not completed high school are five times more likely to drop out. To be successful, the Commonwealth's strategies must energize and gain the commitment of all the state's political, education, business, and civic leaders.
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Keywords: Distance education, adult education

Introduction:

No strategy will succeed unless it engages leaders in each community and county to identify needs and develop programs and services appropriate to the community's unique circumstances. The most serious challenge will be to motivate low-skilled, under-educated adults within the working age population to seek further education. Simply expanding the number of providers and programs will not necessarily increase demand from the populations and communities where the needs are greatest. Deepseated social, economic and cultural barriers—many dating back generations—lead people to undervalue education. In addition, in many counties it is difficult for people to see a direct relationship between better education and better-paying jobs.

Either there are no jobs available or many existing employers do little to emphasize the connection between better education and the possibilities for getting a job, keeping a job, or earning a higher wage. For many, getting more education and earning a high school diploma or a college degree has little positive meaning.

Only the negative consequences are obvious: getting more education often means leaving one's family and community for jobs and opportunities for advancement somewhere else. The future of Kentucky depends on uplifting the quality of life and economy of all of Kentucky. The social and economic costs of neglect of large parts of the state will drag down the rest of the state and seriously hinder its capacity to compete in the global economy.

Adult learners have a different approach to learning. By the time you reach adulthood, you're most likely responsible for your own success and you're perfectly capable of making your own decisions once you have the information you need.

Adults learn best when learning is focused on them, not the teacher. This is called andragogy, the process of helping adults learn.

Malcolm Knowles, a pioneer in the study of adult learning, observed that adults learn best when:

1. They understand why something is important to know or do.
2. They have the freedom to learn in their own way.
3. Learning is experiential
4. The time is right for them to learn.
5. The process is positive and encouraging.

Teaching adults can be very challenging, but also very rewarding. Most teachers would agree that the benefits derived from a successful adult education program in agriculture far outweigh the costs. In addition to the direct benefits to adult participants, the teacher, the school, the community, and the secondary program also benefit from a quality adult education program in agriculture.

Adults in agriculture use a number of sources to gain new information that can be used to help them solve problems. Persons employed in agriculture utilize newspapers, magazines, newsletters, radio, television, government publications, internet, and meetings to gather information which can be directly utilized in their business activities. In many communities, the agriculture teacher is the primary source of agricultural information.

Successful adult education programs develop and utilize an Agricultural Education Program Advisory Committee to assess the informational needs of adults in the community. Agriculture teachers should utilize the expertise and communications link, which an effective

advisory committee provides. Specifically, the advisory committee should be asked to provide advice regarding planning, conducting, and evaluating the adult education program in agriculture.

Adult education programs in agriculture should emphasize practical application of the information presented. Topics and information included in adult programs should be provided which fulfills needs of the local community. Providing information which cannot be applied to solve a local problem or address a local issue will generally be viewed as frivolous and over time will result in decreased interest (i.e. participation) in the adult education program.

The role of the agriculture teacher should be as a facilitator of the learning process. Most adults reject the traditional teacher-student relationship, which is necessary to maintain in secondary programs. Teachers should be encouraged to view themselves as partners with adult participants in the learning process. The democratic philosophy of shared responsibility for planning, conducting, and evaluating adult education programs distinguishes adult education from secondary education.

A local plan for adult education in agriculture should consist of two major components. Namely, a broad statement of philosophy, goals, and objectives of the local adult education program, and an annual calendar of program activities.

Adult education in agriculture is important for continued community prosperity, growth, and improvement.

The local Agricultural Education program has a responsibility to provide up-to-date information, training, and retraining for all adults interested in agriculture.

The goals of the Adult Education Program are:

1. To assist adults in establishing personal and business goals.
2. To enhance the self-confidence and decision making skills of adults in agriculture.
3. To develop agricultural leaders.
4. To maintain the local agricultural knowledge and technology base.
5. To improve the home, living, and business conditions of persons employed in agriculture.
6. To encourage adults to participate in cooperative efforts.

The objectives for the local Adult Education program are:
1. To increase the net farm income of local agricultural producers.
2. To improve the safety practices of adults employed in agriculture in the local community.

3. To educate the public about the significant role in agriculture in the local economy.
4. To encourage the use of practices that protect and conserve natural resources to maintain a good environment for everyone.
5. To assist local producers in the development of marketing plans that are tailored to their individual needs.
6. To assist local producers in developing strategies to make optimum use of agricultural support agencies (e.g. FSA, MO Department of Agriculture).

A comprehensive program of adult education in agriculture includes three major components: (a) organized instructional classes for adults, (b) a Young Farmers/Young Farm Wives Chapter, and (c) Farm Business Management Analysis (FBMA). State Agricultural Education Program standards implemented in 1992 indicate that a minimum of 20 clock hours of organized adult education classes be provided. Many local agriculture programs will far exceed this minimum standard. Salary reimbursement Procedures for "Full Time" and Short Term adult programs are.

Distance Learning:

Distance education programs are more popular than ever. College and high school students now have hundreds of legitimate distance education schools to choose from. If you're new to the idea of learning through distance education, this article will help you understand the basics.

Distance education is any type of schooling that takes place away from a physical campus. Distance education is also known as:

- distance learning
- virtual learning
- online learning
- e-learning
- online education
- web-based training

There are two types of programs offered by distance education schools: synchronous learning programs and asynchronous learning programs. With synchronous learning, distance education students must log on to the school's website at a set time. Often, they interact with their peers and professors via group chats, web seminars, video conferencing, and phone call-ins. With asynchronous learning, distance education students complete all coursework on their own time. They often learn via assignment sheets, message boards, email, pre-recorded video lectures, mp3s, and traditional mail

correspondence.

Many students find that distance education courses give them the freedom to complete a degree while meeting their personal and professional obligations. Motivated learners are often able to complete distance education degrees in a fraction of the time often required. Distance education courses also allow students to network with participants from all over the nation.

On the downside, distance education courses do not offer the face-to-face interaction found in traditional classrooms. Some students find that they struggle to stay motivated and meet deadlines due to the independent nature of distance education courses.

When searching for a distance education program, the most important factor to consider is accreditation. Make sure the distance education school you choose is recognized by a regional accreditor or the Distance Education Training Council.

Choosing a Distance Learning Program:

Distance learning is one of the fastest-growing components of higher education. Almost 3.5 million students were enrolled in at least one distance learning course in the fall of 2006 and online enrollments are increasing every year. The convenience of taking classes at any time from any location appeals to today's adult learner, especially those who work, have families or live in rural areas.

Today a growing number of paralegal and legal secretarial programs have a distance learning component (no law schools currently grant credit for distance learning studies). However, not all distance learning programs are of equal quality. Moreover, the increasing popularity of distance learning programs have led to "diploma mills" or "accreditation mills" that offer bogus degrees and certificates. Choosing a distance learning program requires careful research and evaluation. Below are several important factors to consider in choosing a distance learning program.

1- Accreditation. Accreditation is a means of ensuring the quality and effectiveness of higher education institutions and programs in the United States. Eight regional accrediting agencies accredit most of the colleges and universities in the United States. A host of national and professional accrediting organizations also exist, including the Distance Education and Training Council (DETC), an organization that identifies and accredits distance learning programs. These twelve questions outlined by the Council for Higher Education Accreditation are helpful in examining a distance learning program's claims of acccreditation.

In evaluating distance learning paralegal programs, determine if the school is accredited by one of the regional accrediting bodies and by the American Bar Association (ABA). ABA-approval signifies that the school has met certain standards in terms of academics, facilities and instruction. Graduating from an ABA-approved school may give you an advantage in the legal job market.

2- Reputation. The reputation of the distance learning program you attend may hinder or enhance your post-graduate employment prospects. In evaluating the reputation of a distance learning program, you should not solely rely on the school's website or marketing materials. Other ways to investigate the reputation of a distance learning program include:

- Visiting the school.
  - Talking to alumni (contact the career services department for alumni names and contact information).
  - Researching the distance learning program's record with the Better Business Bureau.
  - Talking to paralegals, attorneys and legal employers about the reputation of the school you are considering.
  - Researching the school in print publications, news articles and on the Internet.

3- Academic Offerings. When evaluating distance learning programs, it is also important to consider the program's academic offerings. A quality distance learning program offers a comprehensive curriculum with a variety of options, electives and advanced coursework. Talk to professors or an academic dean regarding the content and delivery of courses. The American Association for Paralegal Education (AAfPE) recommends that paralegal instructional content include courses in legal research and writing, litigation, ethics, contracts, business organizations and torts. In addition, courses should develop students' critical thinking, communication, computational, computer and organizational skills, and competency to handle ethical issues, according to the AAfPE.

Legal programs should also offer an experiential learning component such as an internship, practicum, pro bono work or clinical experience. These are great resume-building opportunities and allow you to learn practical skills and gain real-world experience.

4- Instructional Technologies. Distance learning courses can be delivered in a variety of ways through a growing array of technological tools including audio tapes, CD or DVD ROM's, e-mail, telephone conferences and web-based delivery systems. Questions to ask include whether the program employs a mix of instructional technology? Is hands-on training and support provided? Can students preview courses online and try out the technologies before enrolling?

5- Teaching Staff. The faculty is the backbone of any distance learning program. Are the courses taught by professors or are the courses pre-taped correspondence instruction? If the courses are taught by instructors, what is the background and qualifications of the teaching staff? Are classes taught by paralegals, attorneys or a mix of both?

6- Career Services. Another important consideration in any distance learning program is the extent and quality of its career services program. Research indicates that the greater the resources offered by the career services department, the greater the program's job placement success. You might inquire as to what percentage of graduates find related employment following graduation and whether the career center offers personalized career counseling, job placement assistance, job search seminars, online job boards or resume assistance.

Conclusion:

Material often set different types of materials and educational content in books and pamphlets, books, training guides, trainers, equipment auxiliary audio, visual and material are included such that during actual teaching sessions, are used in the transmission and content but also to achieve the goals of making education programs are important. Additional material for the next stage of learning often means to be expected when developing your learning skills Learners to increase awareness and enjoyment of reading and studying to operate. To improve the quality of life, learning materials should reinforce the skills they acquired previous. This material should have access to information and provide new technology. should also have to make learning more fun. Additional materials should provide opportunities for literacy skills to read and to strengthen their cognitive awareness.

Track materials (continued) which increased literacy skills and knowledge gained is also effective in enriching learning environment for learners are important. Participatory materials to ensure the participation of learners in the learning process and codification are included out of class activities, dialogue, role playing, etc. In traditional programs that the principles of psychology and curriculum planning, less attention is the form of content presentation ie codification and providing books, original format and have the dominant form, while for adult content that could have valuable experience in addition to writing, other ways also be provided Affect the selection of pictures and images related to the concepts and content produced by including them. Learning activities such as activities outside the classroom, dialogue, role playing and ... Another type of content is presented. Duties are placed on the learner, a resource for

developing knowledge, skills and insights he considered. Curriculum content only from the training provided to learners or not, but put together their learning through activities that can inform or does, skills and attitude to achieve. In this case, apart from learning that the assays taught learners directly to sustainable and effective learning occurs in his.

Another way of providing content that is educational activities outside the learning environment possible for learning more and better enables adult learners. For example, hits, field trip experiences for learners or transfer is provided, develop knowledge, insight and skills they will.

To ensure that science curriculum and educational aspects, according to community needs and audiences, application form is provided or not, the content selection criteria should be considered. These criteria is being include knowledge, effectiveness, flexibility, diversity, relevance and practical learning

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Predicting the potential geographical distribution of *Nepeta septemcrenata* in Saint Katherine Protectorate, South Sinai, Egypt using Maxent

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Abstract: Accurate modeling of geographic distributions of species is crucial to various applications in ecology and conservation. Distribution data on threatened and endangered species are often sparse and clustered making it difficult to model their suitable habitat distribution using commonly used modeling approaches. We used a novel method called maximum entropy distribution modeling or Maxent for predicting potential suitable habitat for *Nepeta septemcrenata*, a threatened and endangered species in Saint Katherine Protectorate (SKP), South Sinai, Egypt, using small number of occurrence records. Our objectives were to: (1) predict suitable habitat distribution for threatened herb *Nepeta septemcrenata* using a small number of occurrence records to inform conservation planning in Saint Katherine Protectorate; and (2) identify the environmental factors associated with *N. septemcrenata* habitat distribution. Results showed that the environmental variable with highest gain when used in isolation is bio19 (Precipitation of Coldest Quarter). The approach presented here appears to be quite promising in predicting suitable habitat for threatened and endangered species with small sample records and can be an effective tool for biodiversity conservation planning, monitoring and management.
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Key words: Maxent; *Nepeta septemcrenata*; Saint Katherine Protectorate; prediction; biodiversity conservation; geographical distribution.

1. Introduction

Prediction and mapping of potential suitable habitat for threatened and endangered species is critical for monitoring and restoration of their declining native populations in their natural habitat, artificial introductions, or selecting conservation sites, and conservation and management of their native habitat (Gaston, 1996). But distribution data on threatened and endangered species are often sparse (Ferrier et al., 2002; Engler et al., 2004) and clustered making commonly used habitat modeling approaches difficult. Species distribution modeling tools are becoming increasingly popular in ecology and are being widely used in many ecological applications (Elith et al., 2006; Peterson et al., 2006). These models establish relationships between occurrences of species and biophysical and environmental conditions in the study area. Most species distribution modeling methods are sensitive to sample size (Wisz et al., 2008) and may not accurately predict habitat distribution patterns for threatened and endangered species.

The Saint Katherine region is situated in the southern part of Sinai and is a part of the upper Sinai massif. It is located between 33˚ 55' to 34˚ 30' East and 28° 30' to 28° 35' North. The Saint Katherine Protectorate (SKP) is one of Egypt's largest protected areas and includes the country's highest mountains. This arid, mountainous ecosystem supports a surprising biodiversity and a high proportion of plant endemics and rare plants. The flora of the mountains differs from the other areas, due to its unique geology, morphology and climatic aspects. The soil is formed mainly from mountains weathering, thus it is mainly granitic in origin. The soil layer is generally shallow were the bed rock is close to the surface. Annual rainfall is less than 50 mm. However, rainfall is not of annual character, rather 2 to 3 consecutive years without rainfall is common. Rain takes the form of sporadic flash floods or limited local showers, thus highly spatial heterogeneity in received moisture is also common (Hatab, 2009).

Our objectives were to: (1) predict suitable habitat distribution for threatened herb *Nepeta septemcrenata* using a small number of occurrence records to inform conservation planning in Saint Katherine Protectorate; and (2) identify the environmental factors associated with *N. septemcrenata* habitat distribution. We used species occurrence records, GIS (geographical information system) environmental layers (bioclimatic and topographic), and the maximum entropy distribution modeling approach (Phillips et al., 2006) to predict potential suitable habitat for *N. septemcrenata* .

2. Material and Methods
2.1. Target species and occurrence data

We recorded ninety one occurrence of *N. septemcrenata* (Lamiaceae) species in Saint Katherine Protectorate during the period between March to August 2009; these records represent the total known distribution of the species. *N. septemcrenata* is a threatened and endangered species, near endemic to Sinai and northwest Saudi Arabia (Boulos, 2002). Perennial herbs, appressed-tomentose 30-60 cm, woody at the base: stems many, erect, branched; leaves 1-2.5 x 1- 1.8 cm. ovate-deltoid, obtuse, crenate, the base cordate; petiole 2-8 mm: verticillasters remote, 3-8-flowered on a peduncle 3-6 mm (Boulos, 2002). Anti-viral and bactericidal activity from extract of aerial parts of *N. septemcrenata* was discovered (Soltan et al., 2008).

No specific habitat preference for *N. septemcrenata*, this species located into most of the micro-habitats, included Slope, Terraces, Gorge and Farsh, but showed much better growth in gorges habitats (Omar, 2010). Observation also found that there is no grazing on *N.septemcrenata.* Most of the *N.septemcrenata* populations are small and the plants occurred sporadically in space, as little groups or as individuals. In order to develop an efficient and effective conservation strategy using complementary in situ and ex situ techniques, we must have a clear understanding of *N. septemcrenata* geographical distribution.

2.2. Environmental variables

We considered twenty three environmental variables as potential predictors of the *N. septemcrenata* habitat distribution (Table 1). These variables were chosen based on their biological relevance to plant species distributions and other habitat modeling studies (For example, Kumar et al., 2006; Guisan et al., 2007a, b; Pearson et al., 2007; Murienne et al., 2009). Nineteen bioclimatic variables (Nix, 1986), biologically more meaningful to define eco-physiological tolerances of a species (Graham and Hijmans 2006; Murienne et al., 2009), were obtained from WorldClim dataset (Hijmans et al., 2005; http://www.worldclim.org/bioclim.htm). Altitude (Digital Elevation Model; DEM) data were also obtained from the WorldClim website; 1 km spatial data for model testing (Fielding and Bell, 1997).

However, this approach may not work with a small number of samples because the 'training' and 'test' datasets will be very small (Pearson et al., 2007). Therefore, we explicitly followed Pearson et al. (2007) and used a jackknife procedure, in which model performance is assessed based on its ability to predict the single locality that is excluded from the 'training' dataset (Pearson et al., 2007). Ninety one different predictions were thus made with one of the occurrence records excluded in each prediction and the final

resolution. The DEM data were used to generate slope and aspect (both in degrees) using (ESRI) Environmental Systems Research Institute's ARC GIS version 9.2 and 'Sufrace Analysis' function. All environmental variables were resampled to 1 km spatial resolution. Maxent's predictions are 'cumulative values', representing, as a percentage, the probability value for the current analysis pixel and all other pixels with equal or lower probability values. The algorithm is implemented in a stand-alone, freely available application. In this study we considered each environmental variable (linear features) and its square (quadratic features). Because Maxent utilize pseudo-absence.

2.3. Modeling procedure

We used a novel modeling method called maximum entropy distribution or Maxent which has been found to perform best among many different modeling methods (Elith et al., 2006; Ortega-Huerta and Peterson, 2008), and may remain effective despite small sample sizes (Hernandez et al., 2006; Pearson et al., 2007; Papes and Gaubert, 2007; Wisz et al., 2008; Benito et al., 2009). Maxent is a maximum entropy based machine learning program that estimates the probability distribution for a species' occurrence based on environmental constraints (Phillips et al., 2006).

It requires only species presence data (not absence) and environmental variable (continuous or categorical) layers for the study area. We used the freely available Maxent software, version 3.1 (http://www.cs.princeton.edu/~schapire/maxent/), which generates an estimate of probability of presence of the species that varies from 0 to 1, where 0 being the lowest and 1 the highest probability. The 91 occurrence records and 10 environmental predictors were used in Maxent to model potential habitat distribution for *N.septemcrenata*. Testing or validation is required to assess the predictive performance of the model. Ideally an independent data set should be used for testing the model performance, however, in many cases this will not be available, a situation particular prevalent for threatened and endangered species. Therefore, the most commonly used approach is to partition the data randomly into 'training' and 'test' sets, thus creating quasi-independent potential habitat map was generated using all records (Figure 1). We used the *P* value program provided by Pearson et al. (2007) to test the significance of the model. The jackknife validation test required the use of a threshold to define 'suitable' and 'unsuitable' areas. We used two different thresholds, the 'lowest presence threshold' (LPT, equal to the lowest probability at the species presence locations), and a fixed threshold of 0.10; for more details see Pearson et al. (2007).

3. Results and Discussion

The Maxent model predicted potential suitable habitat for *N.septemcrenata* with high success rates (that is, low omission rates), 98% at LPT. Most suitable habitat for *N.septemcrenata* was predicted in the northern parts of the SKP in South Sinai (Figure 1), and its distribution is quite fragmented. The Maxent model's internal jackknife test of variable importance showed that 'Precipitation of Coldest Quarter (degree C)', and 'Precipitation of Wettest Quarter (degree C)' were the two most important predictors of *N.septemcrenata's* habitat distribution (Figure 2; Table 1). These variables presented the higher gain (that is, contained most information) compared to other variables (Figure 2; Table 1). Using four arbitrarily defined probability classes, the high suitability class had an area of 49 km^2; medium-64.6 km^2; low- 150.4 km^2; and very low-4086 km^2 (Figure 1).

The distribution of highly and moderately suitable areas appears to follow the distribution of highly elevated areas in SKP (Map7 in Omar, 2010). The parts of the study area predicted in the 'very low' suitability class (probability < 0.10) can be interpreted as unsuitable for *N.septemcrenata* (Figure 1). We also calculated total extent of occurrence (EOO, as defined by IUCN, 2001) of *N.septemcrenata* based on the commonly used threshold of 0.4 (That is, the threshold above which the species is more likely to be present; Jimenez-Valverde and Lobo, 2007); it was estimated to be 926 km^2.

In this study we showed that the habitat distribution patterns for threatened and endangered plant species such as *N.septemcrenata* can be modeled using a small number of occurrence records and environmental variables using Maxent. This study provides the first predicted potential habitat distribution map for a plant species (*N.septemcrenata*) in SKP. Since Maxent is mapping the fundamental niche (different from occupied niche) of the species using bioclimatic variables the suitable habitat for *N.septemcrenata* may be over predicted in some areas (Pearson 2007; Murienne et al., 2009). The potential habitat distribution map for *N.septemcrenata* can help in planning land use management around its existing populations, discover new populations, identify top-priority survey sites, or set priorities to restore its natural habitat for more effective conservation. More research is needed to determine whether the existing protected areas adequately cover suitable habitat for *N.septemcrenata*. The methodology presented here could be used for quantifying habitat distribution patterns for other threatened and endangered plant and animal species in other areas and may aid field surveys and allocation of conservation and restoration efforts.
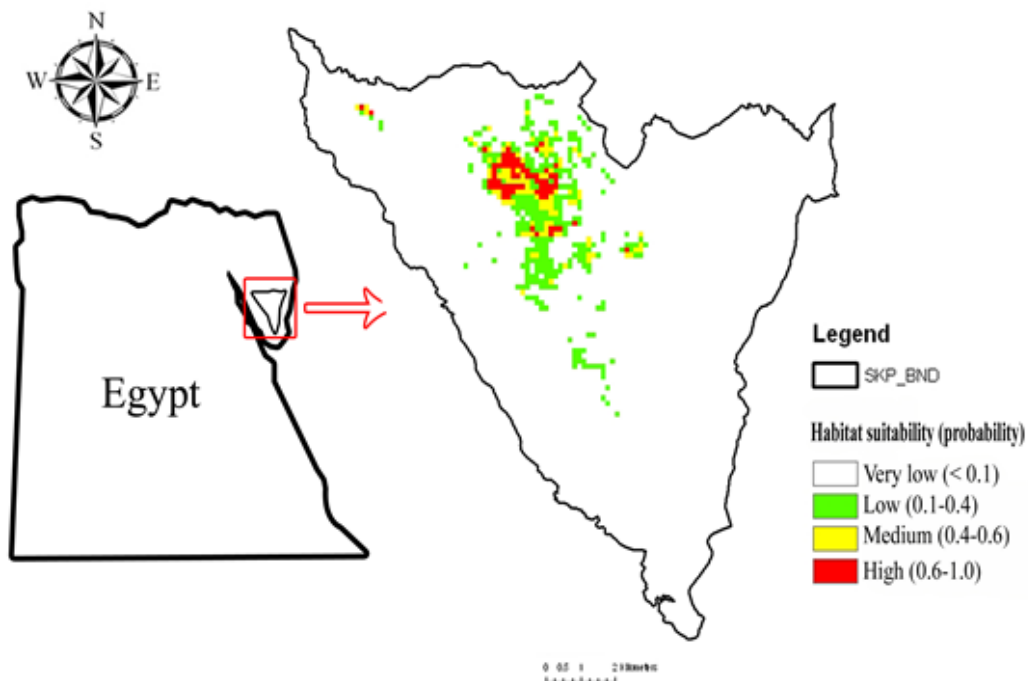

Figure 1. Predicted potential suitable habitat for *N.septemcrenata* species on Saint Katherine Protectorate, South Sinai, Egypt.   Note: SKP_BND is the Saint Katherine Protectorate boundary.

Table 1. Selected environmental variables and their percent contribution in Maxent model for *N. septemcrenata* species in Saint Katherine Protectorate.

Environmental variable	Percent contribution	Source/Reference
Precipitation of Driest Quarter (Bio17, degree C)	37.6	WorldClim; Hijmans et al. 2005
Precipitation of Wettest Period (Bio13, degree C)	30.1	WorldClim; Hijmans et al. 2005
Habitat (degree)	10.4	Generated in GIS
Aspect (degree)	7.2	Generated in GIS
Mean Temperature of Warmest Quarter (Bio10, degree C)	4.5	WorldClim; Hijmans et al. 2005
Precipitation of Coldest Quarter (Bio19, degree C)	3.1	WorldClim; Hijmans et al. 2005
Precipitation of Wettest Quarter (Bio16, degree C)	2.6	WorldClim; Hijmans et al. 2005
Slope (degree)	2.0	Generated in GIS
Mean Diurnal Range (Bio2, degree C)	0.9	WorldClim; Hijmans et al. 2005
Mean Temperature of Driest Quarter (Bio9, degree C)	0.5	WorldClim; Hijmans et al. 2005
Mean Temperature of Coldest Quarter (Bio11, degree C)	0.5	WorldClim; Hijmans et al. 2005
Precipitation of Driest Period (Bio14, degree C)	0.2	WorldClim; Hijmans et al. 2005
Isothermality (Bio3, degree C)	0.2	WorldClim; Hijmans et al. 2005
Temperature Annual Range (Bio7, degree C)	0.2	WorldClim; Hijmans et al. 2005
Precipitation Seasonality (Bio15, degree C)	0.0	WorldClim; Hijmans et al. 2005
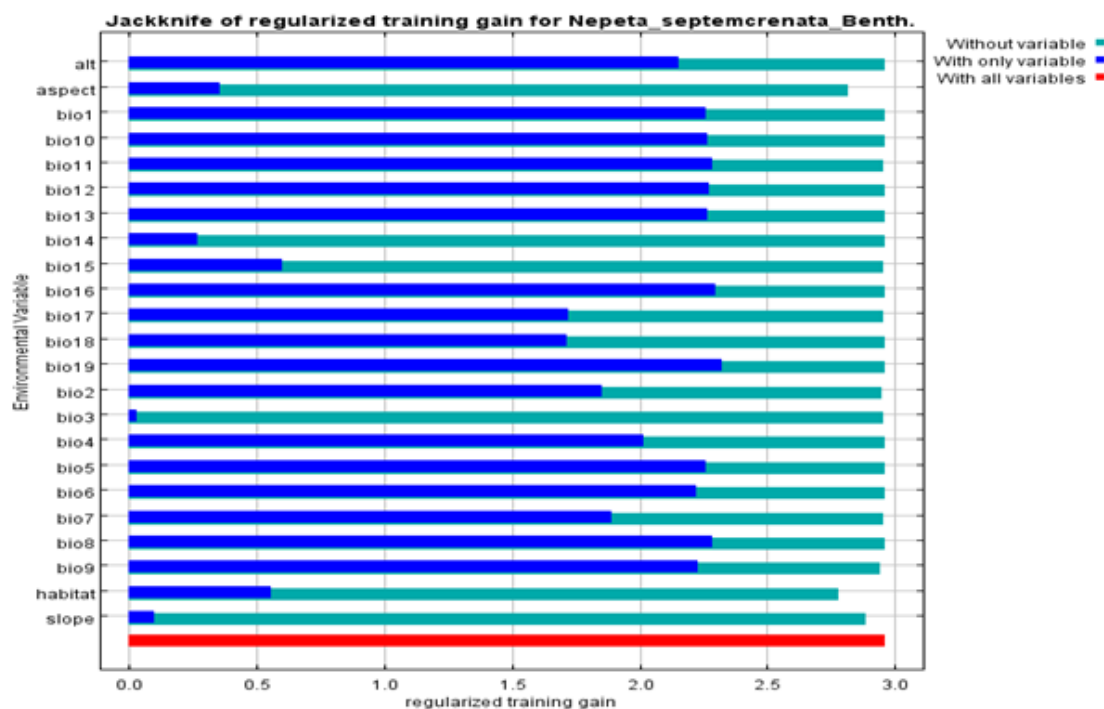
Figure 2. Results of jackknife evaluations of relative importance of predictor variables for *N.septemcrenata* Maxent model.
Note: 'alt   is elevation; Bio 1- Annual Mean Temperature; Bio 2-Mean Monthly Temperature Range; Bio 3 -Isothermality (2/7) (* 100);   Bio 4 -Temperature Seasonality (STD * 100);   Bio 5 -Max Temperature of Warmest Month; Bio 6-Min Temperature of Coldest Month; Bio7 -Temperature Annual Range; Bio 8 -Mean Temperature of Wettest Quarter; Bio 9 -Mean Temperature of Driest Quarter; Bio 10 -   Mean Temperature of Warmest Quarter; Bio 11 -Mean Temperature of Coldest Quarter; Bio 12 -Annual Precipitation; Bio 13 -Precipitation of Wettest Month; Bio 14 -Precipitation of Driest Month; Bio 15 -Precipitation Seasonality (CV); Bio 16 -Precipitation of Wettest Quarter; Bio 17 -Precipitation of Driest Quarter Bio 18 -Precipitation of Warmest Quarter; Bio 19 -Precipitation of Coldest Quarter.

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评庞小峰的非线性量子力学

----21 世纪新弦学概论（7）

林云璀

摘要：《非线性量子力学》论述非常清晰：为创立非线性量子力学，庞小峰大有扳倒薛定谔之势，但全书读来却峰回路转，为实实在在发展量子力学树立了好榜样。

关键词：非线性 薛定谔方程 孤子演示链

一、非线性量子力学的模具之争

笔者与庞小峰先生交往，是从 1982 年看到《自然杂志》第四期发表他的《宏观量子效应》之后开始的，现在还保留着他的三封回信。2011 年 4 月 2 日他的一封回信说："关于你送我的孤子演示链放在那里也没有时间去研究，不好作为一种模型去解决一些问题。请原谅！"可证我们之间已经有 30 年业余与专业交往的情结。这里的非线性量子力学模具之争，不是我们和庞小峰教授的争论，而是我们吸取他的《非线性量子力学》一书中的一些营养，对量子力学及非线性量子力学使用的模具，作一些讨论。周凌云博士曾发表文章评庞小峰的非线性量子力学理论，称之为"天府之国的一支奇葩"，是当之无愧。

如果说普通的老百姓，业余都去看量子力学会致富，那是疯子。但确有人说，在今日一些自诩为物理理论的精英人群，认为数学是物理理论的最高形式，其它形式都是低级形式，他们并不关心说的东西是否真正存在，这难道是要使物理理论成为既不同于宗教，又不同于自然真理的新宗教、新圣经？这就可得到崇拜者的敬仰和源源不断提供的俸禄？这就可对后来人进行愚弄？难道各个国家花费大量资金，就是为造就这几个新教主？有人又说，弦论=胡扯+八道；物理学从爱因斯坦开始，越来越向玄的方向发展；物理学家习惯从数学出发去解释物理现象，发展到登峰造极的就是弦论，这使人们的视线偏离了正确的方向。因为无论是专业人员，还是业余人员，顶尖高手都把自然界的核心秘密锁定在空间的本质上，才能解释一切物理现象。弦论认为空间加时间是 11 维，目的是让人看不懂，认为只有这样才是物理大师。弦论把简单的搞得太复杂了，深噢的搞得太肤浅了，以为普通的人真好骗。说这类话的同志，如果知晓庞小峰的成长和他的《非线性量子力学》，会知道自己说错了。

当然庞小峰先生也不好接触，但这要分情况。业余与专业的成长十分不同。如果把量子力学之难类比玄学、神学，也不为过。但它绝对不是玄学、神学那类没有给出相互作用数学和计算及实验证实的东西。因出生在偏僻农村，解放初看病还普遍是中医，发现农村孺幼皆知一点中医的"阴阳五行，相生相克"的知识，有的还含一点巫术迷信。1958 年大跃进县里各区办中学，我们得以读上初中。一次劳动中因问一位从重庆师专远道分来的物理老师："阴阳五行，相生相克是否属于神学？"这位物理老师一时兴起说："物理学分为四大力学：理论力学、热力学、电动力学、量子力学。中医不是神学，它的阴阳五行，相生相克学说就类似当代的量子力学。你们初中才学的物理学，只算理论力学，而量子力学是太难学了"。

老师的话映像在我们的少年心灵，也许才喜欢上量子力学；这纯属偶然。但其目标不是为当理论物理学家，而是想把量子力学之难，变得要像中医"阴阳五行，相生相克"一样孺幼皆知，即使拿到贫穷偏僻地方，也能给普通老百姓一点实际的兴趣。就这样在上世纪数十年社会风云变幻中，我们仍走上了业余自学跋涉量子力学的不归之路。慢慢地发现量子力学就类似古代的宫廷音乐，它有类似固定的词牌、曲调，然后你可以填词演唱。这里曲调就类似相互作用的数学型式和计算，填词就类似物理模型或模具。这也和四川农村的一些古老的民歌相似。而微观物理模具不同于宏观物理模具，是它们始终只是微观粒子特征的一些模拟。

带着这种眼光，在上世纪六十、七十年代初，我们找到两种模具：线性的称为"类圈体"；非线性的称为"孤子演示链"。所谓的线性：从相互关联的两个角度来界定，其一：叠加原理成立；其二：物理变量间的函数关系是直线，变量间的变化率是恒量。对非线性界定，其一叠加原理不成

立必将导致其二物理变量关系不对称；反之，如果物理变量关系不对称，那么叠加原理将不成立。联系薛定谔（Schrodinger）方程，这里是将物质波的概念和波动方程相结合建立的二阶偏微分方程。ψ（x，y，z）是待求函数，它是 x，y，z 三个变量的复数函数，就是说函数值不一定是实数，也可能是复数。式子最左边的倒三角是一个算符，意思是分别对 ψ（x，y，z）的 x，y，z 坐标求偏导的平方和。E 是粒子本身的能量；U（x，y，z）是描述势场的函数，假设不随时间变化。在给定初始条件和边界条件以及波函数所满足的单值、有限、连续的条件下，可解出波函数 Ψ（r，t）。由此可计算粒子的分布概率和任何可能实验的平均值（期望值）。由于薛定谔方程是一个线性微分方程，所以任意几个解的线性组合还是薛定谔方程的解。因这些特征，只能联系类圈体模具。

1、庞小峰非线性量子力学之眼

由于微观粒子及其相互作用特征看不见，又极其复杂，一种模具可以解释多类现象；而一类现象又可以用多种模具，也不觉为奇。但庞小峰的非线性量子力学之眼是，他强调：1）发展是主题；2）改进的目的是使微观粒子局域，以给出合符粒子具有波-粒二象性；3）建立非线性量子力学是方向，这是把非线性相互作用加进薛定谔方程，使粒子的性质改变。

如果与云南陈蜀乔教授联系超弦目标的真空图像比较，庞小峰教授是简直不提超弦，而实际扩展了超弦理论的应用：如他创造性建立了完整的生物能量传递的新理论；建立了开放的、具有自组织结构的非平衡生命系统的能量、物质和信息相互变化的新的热力学关系及氢键高分子和生物分子系统中质子传递的新理论和生物光子发射的理论，为揭示细胞上的离子通道和植物光合作用的机理，奠定了理论基础；创造性提出和揭示了红外和微波的热和非热生物效应的机理和特征以及磁化水的机理；提出了超导电子和超流液氦原子是一类特殊孤立子，并论证了超导性和超流性是由于这类孤立子的运动引起的；创造性提出和建立了具有重要意义强耦合电-声子系统的新的状态函数等。如果与湖北王守义先生海谈 Navier-Stokes（纳维-斯托克斯）方程和非线性数学对照，庞小峰教授是实实在在建立和完整了的非线性薛定谔方程及其各类解法和理论，撰写了多种非线性量子力学理论专著和论文，并在国内外出版。

2、庞小峰非线性量子力学研究之路

从刘月生教授的结构信息与交换信息看来，真实的微观粒子及其实验是结构信息；而量子力学理论无论线线的还是非线性的，其"歌词、歌曲"都

只能属交换信息。所以说，把非线性相互作用加进薛定谔方程，是使粒子的性质改变，其说法不确切。实际这只是把量子力学描述的粒子的性质改变。庞小峰，四川西充县人，1945 年 12 月出生。1999 年作为特殊人才，从四川民院引进到成都电子科技大学高能电子学研究所作教授，博士导师。现是学校生物物理学科，电磁生物学和生物电子技术省重点实验室主任和生物物理与生物电子学部级重点实验室主任，享受国务院颁发的政府津贴，兼湘潭大学教授、华东师范大学和四川大学兼职教授、纽约科学院成员、美国科学促进联合会国际成员、中国高等科学技术中心成员和中国科学院国际材料物理中心的客座成员和国际一级杂志《物理评论和物理评论通讯》的评审成员等。笔者与庞小峰交往 30 年，其实只有 15 年前的一次个多小时的面对面谈话。

那是为买到重庆出版他的新著，1994 年我们亲自到四川民院庞家去拜访，还送给上了"孤子演示链"的模具。孤波一般是在水槽中演示，庞先生对用铁环编码做成的孤子演示链大加赞赏。我们与他同龄也同年考入大学。他谈到了他传奇的人生经历，使人感到命运无常：他父亲解放前作过伪县长，解放初被镇压。他是跟着在南充中学教书的大哥长大的。1965 年高中毕业，他考上的是四川师范学院物理系，进校的头一年就参加学校在农村搞的四清运动，即在大学就没有正规上过课。不幸中的有幸是他进的四清工作队，还有一位从天津的大学送来受锻炼的一位著名的粒子物理学教授。庞小峰和他相遇认识，关系发展好到师生情谊，并使他钻研和爱上了教授的粒子物理学。由此也很少参加学校文革的派性活动，毕业时他留校任教。文革十年后 1978 年的研究生开考，他在头年也就顺利考上非常难的中国科学院物理研究所的研究生。1981 年研究生毕业他获数理部理学硕士，但仍回到四川师范学院任教。郭柏灵院士和他一起编著过《孤立子》一书，1987 年由科学出版社出版。1995 年郭柏灵院士编著的《非线性演化方程》专著由上海科技教育出版社出版，与庞小峰 1994 年出版的《非线性量子力学理论》专著比较，虽各有特色，但庞书的内容联系物理更多，更容易懂一些。

庞小峰正是在读研究生时，开始了专业研究量子力学和超导、超流及孤子问题之路的。他将孤子理论应用于求解超导金兹堡-朗道 GL）方程和超流GP 方程，由此将孤子概念引入到量子力学来研究微观粒子的特点，他确定了由非线性薛定谔方程的孤子是局域的、具有经典粒子的特点。又通过 20 多年的努力，他解决微观粒子的局域性和具有波粒二象性的办法是，只要计算和考虑微观粒子之间的相互作用，就可以抑制和阻止微观粒子的色散效应。

3、庞小峰的非线性量子力学孤波模具

庞小峰告诉笔者，世界上大多数实验室研究孤波的模具是水槽，他也不例外。据他书中描述，这是个长 38cm，宽 2-3cm 的水槽，水深 2-3cm 高，放在一个能振动的平台上。平台安有电动机，以 7-15Hz 的频率作垂直振动。据庞小峰说，另一个信号发生器是用长条橡皮筋做的，它沿水槽长在水平方向作纵向振动。实验时，会有大量水分子聚焦在一起，在水表面上的一个特定位置形成水分子密度极大的一个非传播的钟型孤立波，它的剖型与非线性量子力学中薛定谔方程的孤子形状完全相同。

水槽模具的最大特色是还能形成"暗孤子"，这模拟方程解中和量子力学中的虚粒子或空穴粒子需要的。因为也有人用橡皮筋和大头针制成单摆链孤子波演示的模具，即利用橡皮筋的扭转力矩和大头针在重力场中的大角度运动，在单摆链上成功地演示了 Sine-Gordon（正弦-戈登）方程的孤子波的产生和传播。我们提出的非线性的"孤子演示链"模具，不是说它比水槽、单摆链模具装置简单，成本低廉，操作方便，而是通过孤子演示链参加的非线性量子力学模具之争，支持庞小峰对薛定谔的波包模具的不完善性的说明；而庞小峰对非线性量子力学特定性的解释，也说明孤子演示链作为水槽模具的补充，使非线性量子力学的模具更加完善。

物理学中数学公式、方程本是来源于物理实验的数据，目的是为了更好地描述物理现象，为实验或工程设计、预见、检验提供精确的计算或数据，但从宏观发展到微观，更多的是一种数学模型或数学图像，并不便于数值计算，而且需要宏观的更直观的模型或模具去理解。例如超导、超流、光纤等宏观量子效应东西中的孤波现象，本身也可以作为非线性量子力学中波粒二象性说明的模具，但为什么又不能流行呢？因为对普通老百姓来说，它们的说明还是很抽象。中医中的阴阳五行，阴阳像一种模型，类似量子弦膜圈中的膜模型或膜面模具。五行金木水火土像一种模具，金木水火土直线排列类似量子弦膜圈中的弦模型或弦线模具，但它们之间的相生相克排列，又类似量子弦膜圈中的圈模型或旋圈模具，而古希腊的火气水土四元素说就没有圈态的循环。但总的来说把它们类比古代的量子力学，都没有提供实验或工程设计、预见、检验可精确计算数据的数学公式或方程，这仍需要具体问题再具体去探索。

西方近代自然科学的兴起，为这种数学公式或方程提供了大量的数学模式和求解方法。如海王星早有伽利略用望远镜看到，但它还是因天王星的轨道异常，被用数学推算出应当具备的位置和质量数据，才发现是新行星。然而 20 世纪进入到相对论和量子论领域，这种数学的作曲不仅更加复杂，而且

作词所需的模具更难准确。这两者反映在我国，类似"伪科学"、"扳倒两论"、"弦论=胡扯+八道"等"国骂"成为一种潮流。庞小峰的非线性量子力学是中流砥柱，为各自振振有辞、五花八门"国骂"的人物找到实实在在的出路树立了好榜样。

二、量子力学的歌词与歌曲之分

庞小峰的《非线性量子力学》，好似特别为要"扳倒量子论"的人写的一样。针对质疑量子力学说的软肋；是建立在 80 年前对"电子云"、"自由电子"等没有根基的猜想，如讲对炉火中物质能烧红并发出橙红色亮光，说明核外电子的运转速率是随着温度改变而呈规律变化的重要细节，它视而不见；又如对直流导线外小磁针的偏转，电子在内、波在外的奥斯特古老的实验，提示电子的运动伴生着波的波、粒二象同时显现，它视而不见等指责，庞小峰类似四两拨千斤，仅在书后用两小节"质子的孤子态的迁移率随系统的温度的变化特点"、"质子的孤子态的传导引起的比热容和临界温度"，回答就像悠扬的音乐，在国家大剧院演奏大幕徐徐落下中结束。这里"音乐"的好坏，可以用广大科学爱好者的评论信，也可自定类似"统一物理学理论学术研究标准"，但考核不会是那种只听得懂音乐歌词，对作曲不甚了了的人说了算数。庞小峰先生重视专家的评奖，局外人给钱也不愿意卖书，有一定道理。

量子力学比音乐复杂得多，把它分为歌词和歌曲两部分只是一种为学好的比拟。音乐只读歌词类似朗读诗；诗歌朗诵也行，但不是音乐。光有类似乐器弹奏的曲调，是音乐，但这类似郭柏灵的《非线性演化方程》专著，是数学的汇集，不像庞小峰的物理专一。把歌词对应模具，也是比拟。吴新忠博士指责把类圈体三旋作模具，是把宏观搬进微观。其实庞小峰的水槽孤立波也何尝不是这样；因为"填词谱曲"模具也可不用真实的实验，也能提供灵感。

1、 自相互作用单独体系的模具模拟

《非线性量子力学》论述清晰：为创立非线性量子力学，庞小峰大有扳倒薛定谔之势，但全书读来却峰回路转。这也类似古乐词牌固定曲调有根可循。庞小峰说，发展量子力学只能选择非线性薛定谔方程和非线性克莱因-戈登（Klein-Gorden）方程，而不能选择其他形式的动力学方程。因为新量子力学不能否定和抛弃原有的量子力学，另起炉灶。即新动力学方程类似 GL 或 GP 方程式，使之具有孤子解。因为微观粒子类似局域性，它的真实存在得缘于研究水波中分子的孤子局域效应。所以即使没有观察到由非线性薛定谔方程描述的微观粒子的局域特性的存在，也深信不疑。而这又得缘于 1839 年罗素在

水渠中观察到孤立波现象。1895 年由浅水波导出 KdV（科特韦格-德弗里斯）方程。20 世纪 70 年代从 KdV 方程等一些非线性偏微分方程，用反散射方法求出了解析解，其解是一个能保持振幅不变传播的孤立波或孤子，从而在国际上引发了"孤子热"。庞小峰和崔洪农等人研究了水孤子具有粒子的许多特点。

1) 庞小峰的理论为什么能使粒子的局域而具有波-粒双重性呢？庞小峰说，线性量子力学仅在非线性作用等于 0 的特殊情况下才正确，而真实的物理系统或多或少都存在非线性相互作用。非线性相互作用产生的根源和机理，首先是粒子间固有的相互作用和自相互作用的机理。其次是介质的非线性效应产生的自聚焦机理。三是粒子和背景场相互作用的自陷机理。

2) 庞小峰说他不能把孤子演示链作为一种模型去解决一些问题，恰恰说明他并没有看到他的水孤波模型，并不是很直观地能反映固有的相互作用和自相互作用，而这恰恰是孤子演示链能给于补充的。线性波在很多媒介中都有色散特性。色散效应类似一束白光通过三棱镜分解为七种不同频率的光。即光的色散需要介质（三棱镜），其介质称为色散需要介质。但这一点恰恰是类圈体自旋模型能自备的。如一个类圈体作对称自旋能产生三类 62 种自旋态。而由类圈体双链编码组装的孤子演示链，也能反映固有的相互作用和自相互作用。孤子演示链也能说明非线性初始微扰对粒子的局域和孤子运动特性的影响。

3) 首先来看自相互作用。色散的本质是波包的振幅随传播距离的增加而衰减，使波动或微观粒子衰减和坍塌。庞小峰的方程是除存在有色散动能项外，还存在非相互作用，它能抑制和抵消色散的衰减效应，从而使微观粒子变成一个稳定的和局域的孤子，而具有明显的粒子性。这在庞小峰的水槽模具中，需要两种信号发生器来模拟，很不直观。所以庞小峰要举不是薛定谔波包圆圈式的平面波的海水中的水波运动观察来阐述。这里的孤立波实际类似水墙，当一列水波接近海岸时，它的形状会逐渐从正弦截面变成三角截面，最终变成运动速度极快的尖峰截面。即当接近海岸时，随时间的增加，这种非线性作用使波的前端变得越来越陡，导致畸变乃至破坏，其本质也类似于色散效应，但它的机理和变化规律与先前水波不同。因为这种非线性作用造成的倒塌现象，可使波的色散效应受到抑制；两者的叠加可使波变成 KdV 方程而具有一个稳定的孤立波。这些结果是不以人的意志为转移的客观规律，因为从非线性薛定谔方程可知，此时的有效势是一个双阱势，它提供了两个基，可通过自相互作用力、

自聚集、自聚焦及自陷等机制，使波局域为一个孤子而处于稳定状态。

2、两粒子相互作用的双链模具模拟

从上面自相互作用可以看出，孤波产生机制的大海，是水潮、海岸、潮汐力浑然一体，比模具水槽孤波的模拟，更具有直观的说服力。这不但说明自相互作用具有普适性，更说明自然现象或真实的实验，及至它的数学方程描述，也要比水槽模具的模拟更真实。这也许说明"填词"比"作曲"更难，即使对薛定谔这样的世界级科学大师也不例外。例如薛定谔方程在量子力学中的地位与牛顿方程在经典力学中的地位相当，但庞小峰等很多人攻击薛定谔，并不在于他的数学，而是他对自己数学的模具解读。如庞小峰攻击薛定谔的波包色散效应，核心不在数学而在模具的缺陷。因为薛定谔方程中本身就有外势项，而薛定谔的波包模具难以把它分为两部分。爱因斯坦也是如此，狭义相对论方程中的负数开平方他主张放弃，而反相人士用"超光速"模具解读；广义相对论方程中的引力他用橡皮膜模具解读为时空弯曲，弦论者却补充用弦星、毛球、葫芦吊等类带线的模具解读引力。

1) 庞小峰为非线性量子力学诞生辩护举的爱因斯坦与玻尔之间的世纪争论，实质也是模具争论。那么粒子的自相互作用和固有的非线性特性的定义是什么呢？庞小峰说：在一个由多粒子或多体组成的系统中，粒子之间或粒子与另一物体之间总是存在相互作用，一旦一粒子受外界影响而发生状态变化时，也影响到其他粒子。当其他粒子运动状态变化时，则此粒子也将受到一种相互作用。这种相互作用常称为粒子间的自相互作用。专业学者是用量子场论方法研究，如哈密顿算符、耦合系数、费米子-反费米子对、泡利矩阵等工具，但物理模具、数学模型仍需其他实体模具补充来解读，因此双链式的孤子演示链得以出场。因为这种单个圈双链编码浑然一体的模具，模拟孤子运动，自然且必然地引入自相互作用和固有的非线性的特性。其次，孤子演示链的重力模拟的是相互作用场理论中粒子的自能。庞小峰说：后者在量子和经典场理论中都存在，故它是一个固有的持久的相互作用。

2) 但在量子场论中，孤子演示链其实是扮演费曼图的虚拟过程的自相互作用的模具角色，也许庞小峰等很多学者都没有想到。主要原因是，我们讲它与基因双螺旋相似的实在结构过多，围绕费曼图讲它的虚拟结构很少。陈蜀乔教授说他的真空场论和弦理论，跑动耦合常数描述两个电子等的相互作用，是可以分为初态粒子与末态粒子，及其它们之间的中间过程的。但庞小峰却换成另一种好似相反

的说法，他说，把粒子的相互作用分成初始无相互作用、相互作用和最后无相互作用的作用过程是不成立的，孤立系统的概念是无意义的。例如，由于虚跃迁的存在，对于一个单一电子来讲，它连续地同自身的电磁场经历了多次相互作用，从而使自己感受到自相互作用和持久相互作用的客观存在。这些虚过程的自相互作用由费曼图描述。在量子统计物理中，这些过程可用一般的微扰理论来计算。在电子和质子之间的相互作用可借助于介子的中间玻色场来传播和调节，这些过程中的共同成分是它们产生和消灭了一个中间成分，其特点可分为四种类型。这些固有非线性相互作用会使微观粒子具有一些经典粒子的特性，对应的粒子系统的动力学方程正好就是非线性薛定谔方程。

3）这些被广泛研究过的费曼图和动力学方程并没有人给出模具演示，而孤子演示链魔幻般孤子运动正好能给予相应的模拟。因为这类双链编码结构的圈子，除开头和结尾可对应初态粒子与末态粒子外，中间并没有圈子迁移运动，模拟传播和调节的只类似中间玻色场的信息和能量，如其多项式流型等类的可通过虚核子-反核子态的产生而出现 $\pi-\pi$ 相互作用。

3、缘起海森堡自旋思想的模具模拟

1）什么叫孤子演示链？孤子演示链起源于三旋理论坚持由环圈耦合组成链。循着这条思路，要模拟机械孤波滚动，需要以两条单链耦合为基础。这可用大小相同的穿钥匙用的铁圆圈 10 至更多个制作。让两列链圈依次对应相交，在链条垂直时，段与段圈之间有上下之分，同段同级的两个圈面可以近乎平行重合；而上下不同级段的圈面也可以相互垂直，且上下两圈面垂直的交线与其过圆心的连线可重合。这种情况称为正交。且因一个铁圈的转动为半角度，要平整又顺当，它们的相交是有严格编码要求的。这样把两根圈链耦合起来，挪动冠链圈，在垂直的时候，就会产生机械孤波滚动。我们把具有这种功能的圈链称为"孤子演示链"。

2）孤子演示链及类圈体模具并非无源之水无本之木，它的开拓缘起海森堡等人最早提出的非线性自旋理论。孤子演示链用来研究双粒子之间的相互作用，类似粒子的集体坐标表示式；具体模拟针对不同对象有不同的表现形式。例如，用正弦-戈登方程描述类似拓扑性的扭结孤子和反扭结孤子传播的孤子演示链，它的每个圈圈体旋是为 1/2 的自旋，可对应粒子系统的费米子和反费米子，其玻色子可采用一个费米子-反费米子对，划段的形式出现。

3）其次，孤子演示链也缘于德布罗意 1926 年为解释电子的干涉和衍射现象，提出粒子与粒子之间有一种位置和动量耦合的假设。特别是 1927 年他

提出的"双重解理论"，认为量子力学方程解除有薛定谔波表示的概率意义外，还有一类是具有"奇点"的 u 波。而所谓奇点在微分几何中，是指环面的拓扑类型。这实质是个圈态理论，而类圈体的三旋符合德布罗意的波-粒二象性既不是波由粒子组成，也不是粒子由波组成的物理图像，具有定域意义和粒子特性。即使到 20 世纪 50 年代，德布罗意认为 u 波满足确定的非线性方程，而没有给出具体的方程，且对多粒子体系和单粒子的 S 波态的描述有困难，也无实验支持。但由此我们联系麦克斯韦的电磁场方程描述电磁波传播，是单链双色圈（变化电场、变化磁场圈）的模具，启发我们把目光转向双链三旋聚色圈的孤子演示链探寻，发现描述粒子的薛定谔方程或海森堡方程或拉格朗日-欧拉方程或哈密顿方程等数学描述，正可定量用于孤子演示链或类圈体。

4）反之这些方程也符合孤子演示链把物质、能量、信息、生命的象征打包思考的特点：

a、如前面已讲过的，孤子演示链中的每个圈子体旋是为 1/2 的自旋，可对应粒子系统的费米子和反费米子；重离子晶格自局域及氢键链中出现的扭结与反扭结结构的扭结孤子对。

b、在多粒子的凝聚态物质中，当电子限制在一维金属链中时，其系统的费米面由两个平行的平面组成；电子密度波的形成是一个周期性的无衰减的孤子。孤子演示链能模拟。

c、在有机分子中的激子激发，由于相邻肽群之间存在偶极-偶极矩相互作用，如果这些肽群是周期分布和等距离分布，会产生共振，引起能量沿分子链传播。孤子演示链能模拟。

d、有些非线性偏微分方程如 KdV 方程用反色散法能求出解析解，其解是一个能保持振幅不变传播的孤立波或孤子。薛定谔方程能衔接非线性与孤子的也是振幅不变，以及解表示的平面波粒子运动如关在一个箱子里就成一个驻波。孤子演示链圈子是整数和半径固定能模拟。

e、求解三维非线性薛定谔方程，在二维情况下有人求出涡旋解和螺旋涡旋解，它的振幅在沿传播方向是周期调制的，此孤子是一个空间圆柱状的波束。孤子演示链能模拟。

f、孤子演示链能表现质子的孤子态传递既可以离子缺陷开始，也可以键缺陷开始。即缺陷运动必须通过质子跳跃，这个"跨越者"有既能跨过键内势垒，也能跨过键间势垒的特点。

g、从陈蜀乔到庞小峰的非线性理论都强调，微观粒子不论处于相干态还是压缩态的单量子、双量子、电-声子耦合系统，其坐标和动量之间最小测不准关系不会因运动和时间的变化而改变，这种关系

只与普朗克量子常数相关。同一孤子演示链的圈子半径不变能象征模拟。

三、人一机展望非线性量子力学

一根随手携带的孤子演示链，能装下半个非线性量子力学，神奇吗？不神奇。对此，创立了非线性量子力学的庞小峰先生却说他"不好作为模型去解决问题"，奇怪吗？不奇怪。

神奇的是量子力学类似音乐有词与曲，奇怪的是量子力学的数学与模具常是阴差阳错。这正如庞先生批评薛定谔能创立薛定谔方程，却用色散的平面波包解读粒子性，模具是南辕北辙。而他自己蹈类似窠臼：用水槽装双信号发生器模拟孤波的自相互作用，模具的解读并不浑然一体。音乐的词与曲绝妙之难，一些好听音乐人们会长久记得它们的作曲者和演唱家。同样人们也难以抹掉创立量子力学丰功伟业的玻尔、德布罗意、薛定谔、海森堡、玻恩、狄拉克等人物。然而不管是线性还是非线性量子力学，其基本原理和理论的数学和求解方法，一味追求算符、矩阵、哈密顿量、本征态、基矢量、偏微分方程、拉格朗日函数、傅里叶变换、微扰求解法、分离变量法、降维求解法，等等，类似古代宫廷化音乐的技术，这像宝塔尖一样脱离了很多人驾驭数学的现实。也使造反代替创新之声在大学和研究院所都不少见。

1、弦论研究的缺陷

要当明星的作曲家，必要的作曲知识和训练是必须的；要改造量子力学，掌握必备的数学功夫也是必要的。庞小峰先生在加入孤子问题的方程建立和求解的潮流中，作有自己独自的贡献，《非线性量子力学》中就显示有他的这些数学功夫。有人会问：为什么孤子没有取代弦论成为国际主流？其实无论孤子还是弦膜圈说，都是偏微分方程的一种模具。例如一质量均匀分布的悬线，两端固定，求它在自身重量作用下的状态，就是右端不显含 y 的二阶导数方程，称为曲线方程。所以用弦论的模具象征来表达偏微分方程的广泛运用，也无不妥。例如在萨斯坎德的《黑洞战争》书中从一根吉他弦，被拨动而激发的振动联系到一根被高度激发的弦互相缠结伸展成纱线球，在没有上限和能量更多的条件下，可以用来描述黑洞，甚至巨型黑洞这些互相纠缠的"怪物弦"。然而这种无所不能的弦怪物，作为模具也很有缺陷。

例如萨斯坎德讲，弦相遇的时候，基本弦可以相互穿越。但萨斯坎德也承认，真实模具的弦线做这些，必须切断其中一根，然后在它们穿越后重新接上它。正是在这一点上，至少庞小峰说的孤波模具胜过了萨斯坎德说的琴弦模具。例如庞小峰讲，

罗素发现的孤波到 KdV 方程描述的波动特征，在两个孤子的碰撞后能保持原有向前运动，就像经典粒子的碰撞一样，这一结果已被他和很多人的水槽实验观察和数值模拟结果所证实。然而在庞小峰书第 5 章和第 8 章一些描述孤立波相互碰撞特征的图例中，可以清楚地看出这些孤立波运动也类似一道水墙，简化为一种弦线的象征，也是可以的。所以，如果不计较学派之争，把非线性量子力学说成弦理论在我国的一种自主创新发展，也是可以理解的。

2、高温超导的缺失

类此的一些考虑，庞小峰先生的《非线性量子力学》被选入《科学前沿弦膜圈说手册大全》丛书参考书目，是恰当的。这是孤子的一些标准数学方程与弦膜圈说量子力学进行的数学接轨，而我国现在有许多专业的和业余的科学爱好者，正涉足第三次超弦革命，这必将加速人们对西方超弦理论的一些标准数学方程及其求解方法和模具模拟的认识。特别庞小峰先生把非线性的一些孤子数学方程及其求解方法，运用到了有机分子的乙酰苯胺、蛋白质分子、分子晶体结构、氢键结构和质子运动等常温下一般大学和研究院所都能操作的领域，会引领第三次超弦革命更具有广泛的实践性。那么是否非线性量子力学的数学运用就完善了呢？

我们来看看庞小峰先生在超导性和超流性是由孤子运动引起方面的论证。

上世纪六七十年代国际上掀起孤子热，国内还处在层子热中，七十年代末庞小峰已在中科院物理所作研究生，为什么不把孤子的一些方程应用到层子数学上，也许他还能留中科院呢？刘月生教授是多年研究结构信息和交换信息的专家，中国没有诞生相对论和量子论，但诞生过实践论与矛盾论。其实结构信息可以类似对应实践论，交换信息可以类似对应矛盾论。因为实践前进到变革原子，也许世界上大多数国家的财力和人力还能进行核试验，但要单独搞大型强子对撞机之类的变革质子、夸克等的实践，就不太容易。这种受阻，萨斯坎德的"黑洞战争"还认为，这类实践变革即使是针对同一个事件，但如果是视界内外两种人的观察，而且又是不一致的两个观测的结论，要合在其中一种人的脑海景象中，不矛盾是不可能的。实践即使是同一个人，针对同一类的事件，但如果实验是不同时的两次观察，而且用的方法也不同，又是不一致的两个观测的结论，要合在一个人的脑海景象中，不矛盾是不可能的。庞小峰是个重视实践论的人，层子和量子是两种唯物观察的交换信息，不像孤子相对层子，人类已积累了大量的实践材料。例如庞小峰说，1957 年巴丁、库柏和徐瑞弗提出了低温超导理论，即 BCS 理论，认为在超导体中由于电子和晶格振动

（声子）的相互作用所提供的吸引力胜过电子之间的库仑排斥作用，从而使具有大小相同、方向相反的能量和自旋的两个电子形成了束缚的电子对。如果用模具来表征电子对，它的实质是什么？仅是宏观量子效应吗？

我们认为电子对的实质类似一个小环圈及面旋，它在晶格中的不被散射能环流流动，就类似飞去来器的不被"散射"。庞小峰说，宏观量子效应包括磁通量子化、超导体的涡旋线结构等，对液氦超流相也存在着与超导体中的磁通量子化相类似的环流量子化及涡旋线结构。

涡旋线结构在三旋理论中类似线旋。庞小峰在180页书的图6·9出现孤立波的水槽底部测得的水分子旋转运动的流线图，就是一个线旋示意图。奇怪的是《非线性量子力学》全书讲的都是在低温超导的应用，高温超导如从高温氧化物超导系列到铁基高温超导材料，近20多年来都成热门课题，为什么他不拿孤波或孤子模具去运用？高温超导研究的缺失，说明孤波模具也难一手打天下。孤波实际类似庞加莱猜想的弦球论，不含逆庞加莱猜想的弦环论。由于三旋理论能说明电子对类似小旋圈，所以在高温超导出现不久，就有公开论文发表应用。

3、两论展望非线性量子力学

也许我们应该换一种解读。从实践论来说，庞小峰长期作为一所普通大学的一名普通教师来说，做高温超导体实验的条件不如做水槽孤波实验那么容易。没有实验作基础，理论难以得到定量的自我检测。其次，庞小峰虽然对非线性量子力学的一些方程及解法进行了成功的探索和梳理，并在生物有机分子、氢键系统等力所能及的工作中作了大量的应用举要，但这种工作不是一劳永逸的，也不是直接搬到高温超导体就能轻易定量运用的。从庞小峰的书也可以看到，他建树非线性量子力学方程及解法和应用的贡献中，也有大量他人的成功探索在作基础。在这一点上，各类高温超导材料的机理与BCS理论并不完全一致，从而所作的定量数学描述并不如低温超导那么成功；同样我们所作的高温超导的探索，也是属于定性阶段。

1）水槽产生的孤波虽然可以表征粒子，但和孤子演示链的单独一个圈子比起来，它和自己水槽其余的水最终没有彻底切割。再说孤子的钟形弦态，与圈子的奇点孔态，在拓扑类型是不统一的；但水槽和孤子演示链各自都在模拟孤子，现象又是统一的。这里彰显了萨斯坎德微观领域矛盾自然性定律，也是非线性量子力学一种特性。而解决这种矛盾论，出路重在立言立论者以此能不断拿出实践有效的成果。我们把此实践论对应结构信息称为"机"；把前者立言立论的矛盾论对应交换信息称为"人"。

结合萨斯坎德的新实践-矛盾论定律，求衡应是：人-机合作；人-机分择。在这方面庞小峰既不墨守成规，也不另起炉灶树立了好榜样。

A、所谓的人-机合作，也许也包括"没有条件，创造条件也要上"的态度，但这应该是客观和现实的。即使如庞小峰的水槽发生孤波这种自然现象，也说明孤波的产生是有条件的。其次，非线性量子力学方程也不全是产生孤波解，例如还有混沌解等。庞小峰说，由大量原子和分子组成的物理系统或物质（生命），有时具有明显的各向异性的结构特点。在此系统或物质中的微观粒子可"感受"到由介质提供的一个非线性作用。所以他把目光转向自己可接触到的物质上，去作自己立言立论的应用。即使他心比天高，想扳倒薛定谔，扳倒线性量子力学，试图统一解释宇宙的物理学理论，也得忍。但他的这些应用，即使没有做大型强子对撞机实验的技术含量那么高，因是稳扎稳打，花学校或国家一分钱就能干一分事。他成功了。

B、所谓的人-机分择，也许也包括尊重自然，尊重客观，尊重现实，尊重他人。包括不把自己看成"老子天下第一"，自己的才是逻辑一致或无逻辑矛盾的标准；见到别人做大型强子对撞机实验就骂，甚至主张学术"创新"要用暴力革命的办法去摧毁研究的对方。大型强子对撞机实验之所以能进入现代，国际科学主流不是为了一较长短才去发明。大型强子对撞机及夸克弦实验的发展路径表明、提醒的是：人类已拥有尖端的技术，管理体制也更加成熟，能够承担量子夸克等探索的实践。你不花一分钱，让有能力的人去闯，成败碍不着你的事。

C、庞小峰是个懂得人-机合作；人-机分择的人。他能知自己未来十几年之内都不太可做大型强子对撞机实验、做夸克弦实验。但他说，在生命活动中需要孤子，因为它能把生物能量和信息无损失地传到目的地，从而可保证人和动物感受外界的能量和信息的刺激。反之也才能把大脑的信息和能量正确地传到响应的目的地和组织，以维持生命体自身的生存。于是敏锐冲刺把非线性孤子弦引进生命有机分子的线链，化学分子的价、键链，氢键系统的质子运动链。因都能紧密暗含孤子演示链的模具，不但成功；反之，这里孤子演示链的费曼图也暗示价键有夸克弦。

2）于是那些"扳倒量子论"的电子云、自由电子在这里，也许变成了夸克-胶子色荷云、夸克海、海夸克。人-机分择，未来低碳清洁无核污染的新能源如"夸克球"颗粒，就让大型强子对撞机的设备去研究、生产供应全球吧。宁平治先生说，作为基础研究，物质微观结构研究的潜在意义，在于其某些方面未来可能转化为技术与生产力：100年前卢瑟福研究"有核原子"时，并不清楚他开创的原子核

物理研究成果将导致核能源等的应用。质子内复杂的夸克-胶子运动，决定了质子内有一定的电荷分布和磁化分布。电子探针通过电子-质子弹性散射可探知质子内部的电磁结构。探测核子大小和结构是直接采用"形状因子"的定义。形状因子反映质子的非点特征，联系着质子大小，可以反映出电子分别与有结构的核子或无结构的"点"核子发生散射时的差别。有新实验揭示，质子的电荷分布具有球形和非球形的电荷云，它们叠加的效果对应于质子的整体变形。通常情况下，夸克和胶子被强相互作用力禁闭在强子中，通过对普通原子核"加热"，有可能使强子"融化"从而形成由自由夸克和胶子组成的夸克-胶子等离子体。这些工作当然不是我们人人能做的，但我们能不让做吗？

3) 而孤子演示链费曼图从夸克-胶子色荷云、夸克海、海夸克也可以联想做力所能及的人-机合作，如据王小龙先生报道，德国的迈特纳多佛教授开发出一种电子皮肤，能让机器人分清冷热轻重等多种感觉，并在一个机械臂上获得了应用。这是他和同事设计了一种只有5平方厘米大小的六边形电路板的基本模块。每一块电路板上包含有4个红外传感器、6个温度传感器和一个速度传感器，这些传感器能"察觉"到一厘米范围内的任何物体。此外，这种电路板上还留有一定的扩展空间，可供以后加入如包括压力传感器在内的其他功能的传感装置。在实际应用时，将这些"皮肤模块"像蜂窝一样拼接起来就能构成面积较大的电子皮肤。

A、联系把古代中医看作类似我国古代人-机合作的量子力学，那是古代在没有现代量子力学的技术手段和知识积累下，中医用力所能及理解的"阴阳五行、相生相克"模具和望闻问切的"皮肤"等手段，进行力所能及的推广普及应用。也许有人会问：成都名中医对坐月子是受中医文化影响的陋习等言论进行炮轰，方舟子的反轰是，中医重复传统的伪科学和迷信，成都名中医只会剽窃西医的说法，让看的国际期刊文献也看不懂；成都名中医要比医生资格？中医文凭不过是用一张纸来骗人。应如何对待呢？其实绵阳名中医张耀主任医师说，诋毁中医是伪科学，极为偏激；西医传入我国只有近百年的历史，中医药技术为中华民族的繁衍做出了不可磨灭的贡献，就说得好。由于未来十几年之内我国中医，甚至西医，要普及应用或学习现代量子力学，技术和条件都还难具备，所以从人-机分择来说，传统的中西医药技术，仍是能做出不可磨灭贡献的需要。这里望闻问切的中医"皮肤"联系电子皮肤的科学，从表面看也都没有达到夸克-胶子色荷云、夸克海、海夸克的深度，但其相同原理也在起作用。即从真实的皮肤到我们人的大脑，实际也有电子皮肤类似物理的作用。深层次正像庞小峰的孤子模型

应用讲的，孤子对能量和信息无损失地传递，起着将环境与体内组织区分开来的作用，与此同时还具有强大的交互能力。这正是中医量子力学模具与孤子模具相通相应的地方。

B、两论展望非线性量子力学，人-机合作；人-机分择能提供的领域很多、很广。例如类似电子云、自由电子、夸克海、色荷云孤波的普遍存在，有人利用研发的新型光学传感器 PROPS，发现大肠杆菌的个体细胞会产生类似神经元放电那样的尖峰电脉冲。这种电尖峰信号也许与这些细菌细胞中的离子通道的开放有关。于是采用一种荧光蛋白杂交使用方法，像生物探针那样对个体大肠杆菌活细胞进行电生理测量，结果发现许多细菌细胞会有电光闪烁，有些细胞缓慢地闪烁，有些则快速地闪烁，频率在一赫兹左右。在闪烁的大肠杆菌细胞中的这种尖峰样电活动持续的时间在1至40秒间不等，而且还对一系列的物理和化学干扰敏感。这种检测到某个细菌细胞膜会产生类似神经元放电那样的尖峰电脉冲信号的技术，是令人震惊的，它可用于检测医学、环境和工业中具有重要意义的多种细菌的膜电位或电压。

C、前沿基础科学如果属于"学术"，应以包容的态度对待其发展存在的问题与缺陷，通过争鸣和讨论达成共识，更是一种人间正道。而引发人-机恐惧的是把自己看成"老子天下第一"，自己的才是逻辑一致或无逻辑矛盾的标准这类人-机竞争。王一方先生说，以炫耀和利益为目的，如在食品中掺入塑化剂，在牛奶中注入三聚氰胺的"创新"，缺乏道德的"正当性"，偏离了"人间正道"。祝庞小峰先生的非线性量子力学在人间正道高歌猛进。

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精密结构常数 $1/α = hC/(2πe^2) = 137.036$ 可能会有什么含义？

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【内容摘要】。通过对狄拉克的大数 $1/L_n$ 和精密结构常数 $1/α$ 的类似对比，并对万有引力 F_g 与黑洞引力 F_b 作类似对比，可得出较合理的结论，$1/α$ 可能是原子核内强力 Fn 与电磁力 F_e 之比的倍数，即 $1/α = Fn/F_e = 137.036$.

【关键词】。精密结构常数 $1/α = hC/(2πe^2) = 137.$；精密结构常数 $1/α$ 的含义；狄拉克大数 L_n

【1】。精密结构常数 $1/α$ 可定义为 $1/α = hC/(2πe^2) = 137.036.$

$$1/α = hC/(2πe^2) = 137.036 \qquad (1a)$$

在上面 **(1a)** 中，普朗克常数 $h=6.626×10^{-27}g_*cm^2/s$；光速 $C = 2.998×10^{10}cm/s$；电子电量 $e = 4.80325×10^{-10}esu = 1.6022×10^{-19}C$（库伦）；于是，$1/α = hC/(2πe^2) = 6.626×10^{-27}×2.998 × 10^{10} /[2π(4.80325×10^{-10})^2] = 137,0368 ≈ 137.036.$

在下面，让我们试着来解读精密结构常数 $1/α$ 的含义.

【2】。首先来回顾一下拉克的大数 L_n 是怎样来的。按照拉克的'大数假设'的观念，求电磁力 F_e 与万有引力 F_g，之比 F_e/F_g。以氢原子作为模型，质子质量 $m_p = 1.6727×10^{-24}g$，电子质量 $m_e = 9.1096×10^{-28}g$，**电子电量** $e = - e = 1.602×10^{-19}$ C, r 是正负电子之间的距离，万有引力常数 $G = 6.6726×10^{-8}$ cm³/s²*g，实验测定的比例常数 $k=9.0×10^9$ N•m²/C²。于是，

$$F_g = Gm_pm_e /r^2 = 6.6726×10^{-8}×1.6727×10^{-24}×9.1096×10^{-28}/ r^2 = 101.67×10^{-60}/ r^2 [1] \qquad (2a)$$

$$F_e = ke^2/r^2 = 9.0×10^9 N•m^2/C^2×(1.6022 ×10^{-19}C)^2/ r^2 = 9.0×10^9×10^5×10^4×(1.6022×10^{-19}C)^2 /r^2 = 23.10×10^{-20}/ r^2 [1] \qquad (2b)$$

$$F_e/F_g = L_n = 23.10×10^{-20}/101.67×10^{-60} = 2.35×10^{39} [1] \qquad (2c)$$

(2c) 式表明，在相同的距离 r 时，无量纲常数 $L_n = F_e/F_g = ke^2/Gm_pm_e = 2.35×10^{39}$ 表示 电磁力 F_e 与万有引力 F_g 之比或者说倍数。

【3】。既然 $L_n = F_e/F_g = ke^2/Gm_pm_e$ 之比等于 $2.35×10^{39}$，上面 2 种比例模型 Gm_pm_e/e^2 和 $hC/(2πe^2)$ 是类似的，而 $1/L_n$ 与 $1/α$ 又都是无量纲常数。**因此，推测** $1/α = hC/(2πe^2)$ **为2种力之比就会显得颇有理由**。现在来用黑洞的公式做类似的对比。设 M_b 是任何一个黑洞的质量，m_{ss} 是该黑洞在其视界半径 R_b 的霍金量子辐射的质量。于是，可得出一个普遍的

公式 **(3a)**，见参考文献[2].

$$m_{ss} M_b = hC/8πG^{[2]} \qquad (3a)$$
$$\text{Let } 4Gm_{ss}M_b = hC/2π \qquad (3b)$$
$$4Gm_{ss}M_b/e^2 = hC/2πe^2 \qquad (3c)$$

对比(2c)与(3c)，由此可见，$Gm_{ss}M_b/R_b^2 = F_b$ 就是黑洞对其霍金量子辐射 m_{ss} 的引力。而对应的 $F_e = e^2/r_n^2$，就是电子之间的电磁力。再令 **Fn = 4F_b**，于是，

$$Fn/F_e = hC/2πe^2 = 1/α = 137.036 \qquad (3d)$$

从类似的对比来看，Fn 可能是强力=原子核内夸克之间的作用力。当 $r_n = 2R_b$ 时，

$$Fn = hC/2πr_n^2 = F_b \qquad (3e)$$

强力 Fn 有多强？**1*.** 假设 $r_n ≈ 10^{-13}$cm, 则 $Fn = hC/2πr_n^2 = 6.626 ×10^{-27}× 2.998×10^{10}/2π×10^{-26} = 0.316×10^{10}$ dyne. 而电磁力 $F_e = e^2/r_n^2 = (4.80325×10^{-10})^2/10^{-26} = 23.07×10^6$ dyne. 于是，$\underline{Fn/F_e = 0.316×10^{10}/23.07 ×10^6 = 136.97≈137.036 =1/α}$. **2***，如果取 $r_n =2R_b ≈ 10^{-13}$cm,则，$M_b = 10^{15}g$，$m_{ss} = 1.76×10^{-24}g ≈1$ 质子质量，表明核力 F_n 相当于 $M_b =10^{15}g$ 的黑洞对 **1**质子 m_{ss} 的引力。

【4】。结论: 正如 $F_e/F_g =10^{-39} = 1/L_n$，可得出了 **Fn/F_e = 137** =1/α. 因此，**L_n 与 α 可认为 都是耦合系数**。既然 L_n 可作为电磁力 F_e 与万有引力 F_g 的**耦合系数**，那么，**α 就可以看成是原子核内核力Fn 与电磁力 F_e 的耦合系数**。由于强力Fn 至今还未被清楚地认知和得出正确的计算公式，作者只能用黑洞的公式与原子核内的核力作类似的对比而做出推论，因为二者的作用都是量子化的。我想, **$\underline{Fn = hC/2πr_n^2}$ 作为原子核里的核力，和 $\underline{1/α = Fn / F_e}$ 作为核力Fn 与电磁力 F_e 之比或称耦合系数是较为合理的。**

====全文完====

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Approaches To Summarize Multi Documents Using Information Extraction

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Abstract: No one has time to read everything, yet we often have to make critical decisions based on what we are able to understand. With summaries, we can make effective decisions in less time. Thus the technology of automatic text summarization is becoming essential to deal with the problem of information overload. Text summarization is the process of extracting the most important information from a single document or from a set of documents to produce a short and information rich summary for a particular user or task. Multi-document summarization is an automatic procedure for extraction of information from multiple texts about the same topic. Most of the MDS systems have been based on an extraction method, which identifies key textual segments (e.g., sentences or paragraphs) in source documents and selects them for the summary. Multi-document summarization aims to distill the most important information from a set of documents to generate a compressed summary. In this paper we are introducing various approaches for multi document summarization using information extraction.
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Introduction

In the literature, the summaries are considered of two types: Extractive summaries and Abstractive summaries. An extractive summary is generated by selecting sentences from the document(s), while an abstractive summary can have non-existing words or sentences in the original document(s). In addition to the initial research area of single-document summarization, recent research work has focused on multi-document summaries. In multi-document summarization, the generated summary is created by the synthesis of multiple documents instead of a single document.

The aim of the multi-document summarization is to present multiple documents in form of a short summary. This short summary can be used as a replacement for the original documents to reduce, for instance, the time a reader would spend if she/he were to read the original documents. Various approaches have been applied in multi-document summarization task. Few of the important approaches for MDS using information extraction are described in this paper.

The goal of the automatic text summarization is to provide a user with a presentation of the substance of a body of material in a coherent and concise form to save time and effort. Ideally, a summary should contain only the "right" amount of the interesting information and it should omit all the redundant and "uninteresting" material. The summary produced by automatic summarization can be of two types-generic or user specific. The generic summaries contain the over all most salient information from the original documents while the user specific summaries contain the most relevant information depending upon the choice and interests of the user.

Automatic text summarization can be broadly categorized in two types based on the number of source documents: Single Document Summarization and Multi Document Summarization (MDS).

Single Document Summarization

As the name suggests in single document summarization there is only one large source document Single document summarization is easy as compared to multi document summarization task. As in single document summarization there is no issue of multiple languages, multiple input format, writing style, redundancy of information etc.

Multi-document Summarization

In case of multi document summarization the information is distributed over multiple source documents. The multi-document summarization task has turned out to be much more complex than summarizing a single document, even a very large one. This difficulty arises from inevitable thematic diversity within a large set of documents. These documents can be in different languages, written by different authors having different background knowledge and different document formats. A good summarization technology aims to combine the main themes with completeness, readability, and conciseness. An ideal multi-document summarization system does not simply shorten the

source texts but presents information organized around the key aspects to represent a wider diversity of views on the topic. When such quality is achieved, an automatic multi-document summary is perceived more like an over view of a given topic.

The multi document summarization can be categorized along two different dimensions: abstract-based [2, 3] and extract-based [4, 5]. An extract-summary consists of sentences extracted from the document while an abstract-summary may employ words and phrases that do not appear in the original document. The extractive summarization tries to select a number of indicative sentences, passages or paragraphs from the original document according to a target summarization ratio, and then sequence them together to form summary. The abstractive summarization, on the other hand, tries to produce a concise abstract of desired length that can reflect the key concepts of the document. The latter seems to be more difficult, and most of the recent approaches have focused more on the extraction based summarization.

Information Extraction Approaches

There are several ways in which one can characterize different approaches to information extraction based summarization. One useful way is to examine the level of processing. Based on this, summarization can be characterized as approaching the problem at the surface, entity, or discourse levels [1].

Surface-level approaches [4, 5, 7] tend to represent information in terms of shallow features which are then selectively combined together to yield a salience function used to extract information. These features include frequency, location, background, cue words and phrases. Entity-level approaches [8, 9] build an internal representation for text, modeling text entities and their relationships. These approaches tend to represent connectivity in the text to help determine what is salient. Relationships between entities include similarity, proximity, co-occurrence, thesaural relationships among words (synonymy, antonym, parts-of relations), logical relations (agreement, contradiction, and consistency) syntactic relations. Discourse-level approaches [6, 10] model the global structure of the text, and its relation to communicative goals. This structure can include format of the document, threads of topics as they are revealed in the text, and rhetorical structure of the text, such as argumentation or narrative structure. These are the primary examples of the approaches, and many systems adopt a hybrid approach (e.g., taking a discourse level approach where the smallest segments are surface strings or entities). K.Ramanathan et.al [13] has proposed a new language independent single-document summarization method. They map document sentences to semantic concepts in Wikipedia and select

sentences for the summary based on the frequency of the mapped-to concepts.

Different MDS systems use different measures in assigning the salience score to the sentences. Based on the methods the MDS systems employ in assigning salience score to the sentences, they can broadly be classified into three categories as centroid based, clustering based and graph based summarization. Here we briefly describe the general methods employed in assigning salience scores for the sentences in each of these three categories.

Clustering Based MDS

One of the first and very popular approaches to MDS was cluster topically related sentences from the input and select one sentence from the cluster as a representative of the topic in the summary [11].These summarizers obviously try to exploit frequency on the sentence level, clusters with more sentences considered more important. Again, a hidden parameter can change the results considerably since if lower similarity between sentences in the cluster is required, bigger clusters can be formed, but the sentences in them will not be tightly related on the same topic. Such an approach assigning importance to sentences also deals directly with the problem of duplication removal:

Since, only one sentence per cluster is chosen, the summary would not include repetition. Interestingly the size of the cluster (equivalent to sentence frequency), did not lead to good information extraction performance. The problem was addressed by adding in the weighting of term frequency (TF) and inverse document frequency (IDF). The addition of such information, which incorporates in the cluster score, the frequency also of the words in the sentences, leads to much better results in information extraction.

Centroid Based MDS

The centroid-based method is one of the most popular extractive summarization methods. MEAD is an implementation of the centroid-based method. Radev et.al. [7] described an extractive multi document summarizer (MEAD) which chooses a subset of sentences from the original documents based on the centroid of the input documents. For each sentence in a cluster of related documents, MEAD computes three features and uses a linear combination of the three to determine the most important sentences. The three features used are centroid score, position, and overlap with first sentence (or the title).

- ➢ The centroid score C_i is a measure of the centrality of a sentence to the over all topic of a cluster.
- ➢ The position score P_i which decreases linearly as sentence gets farther from the beginning of the document.

> The overlap with first sentence score Fi which is the inner product of the tf-idf weighted vector representations of a given sentence and the first sentence (or title) of the document. All three features are normalized (0-1) and the over all score for a sentence Si is calculated as

$$W(S_i) = W_c * C_i + W_p * P_i + W_f * F_i, \quad (1)$$

Where W_c, W_p, and W_f are the individual weight age given to each type of features respectively. Now the sentences are ranked according to their combined score which is a linear combination of all the sentence features used. All three features are normalized in the range 0–1.[14]

MEAD uses a cosine similarity metric to compare each candidate sentence (for inclusion in the summary) to each higher-ranking sentence. If the candidate sentence is too similar to the specified threshold [14], it is penalized and is not included in the summary. Finally, the top remaining n-percent of the sentences (with the compression rate 'n' being determined by the user), are returned to the user as the summary.

MEAD discards sentences that are too similar to other sentences. Any sentence that is not discarded due to high similarity and which gets a high score is included in the summary.

How the output sentences are ordered is an issue with MEAD. Timestamps are not always available given a set of documents. Sometimes, the sorting of the Timestamps can reach a tie. When a tie occurs, if both the last sentence of one document and the first sentence of the other document are chosen, MEAD can potentially put the former right before the latter in the final summary, which may bring questionable results with regards to the inter-sentence logic.

In general, MEAD is not a trained system. Although Radev et al. (2004) suggested that a training set can be used, the features that such a training process can use are only three: centroid, positional and first sentence overlap. Trainable summarization system was proposed as early as (Kupeic et al., 1995) and recently in (Barzilay and Lee, 2004). It would be interesting to see how a richer feature set would affect the system performance.

Term Frequency Based MDS

Most of the extraction based multi-document summarization systems take advantage of the frequency of individual words. The more number of times a word occur in the source documents increase the chances of it to be included in the summary. The

term frequency is the prime feature in summarization for the TF- IDF based multi-document summarization systems [12]. Here TF represents the term frequency that is the frequency of a word in a document, and IDF represents the inverted document frequency that is the distribution of a term in the whole corpus of data and is equal to the number of documents which contains the term divided by total number of documents in the corpus.

The content that appears frequently in the input has a higher likelihood of being selected a human summarizer for inclusion in a summary. It is observed that high frequency words from input are very likely to appear in the human summary. This confirms that unigram (individual word) frequency is one of most important the feature that impact a human's decision to include specific content in a summary. But the co-occurrence of the individual words in the inputs and the human summaries does not necessarily entail that the same facts have been covered. A better granularity for such investigation is the sequence of such individual words, such as the summary sentences. Thus the overlapping of a sequence summary confirms that both the documents contain same information. Almost all of the systems have used the unigram frequency for assigning salience scores none has selected the frequency of more than single words which conveys more meaning for the assignment of salience score.

One formal method to capture this phenomenon would model the appearance of words in the summary under a multinomial distribution. That is, for each word w in the input vocabulary, we associate a probability p (w) for it to be emitted into a summary. The overall probability of the summary then is

$$(1) \quad \frac{N! \qquad p(w_1)^{n_1} \ldots . (w_r)^{n_r}}{n_1! \ldots n_r!}$$

Where N is the number of words in the summary, $n_1 + ... + n_r = N$ and for each i, n_i is the number of times word w_i appears in the summary and $p(w_i)$ is the probability that w_i appears in the summary.

The following algorithm provides the basis for summarization.

Step 1 Compute the probability distribution over the words w_i appearing in the input, $p(w_i)$ for every i; $p(w_i) = n/N$, where n is the number of times the word appeared in the input, and N is the total number of content word tokens in the input.

Step 2 For each sentence Sj in the input, assign a weight equal to the average probability of the words in the sentence, i.e.

Weight (Sj) =∑ wjϵSj   p (wj)   —————— |{wj|wjϵSj}| (2)

Step 3 Pick the best scoring sentence that contains the highest probability word.

Step 4 For each word wi in the sentence chosen at step 3, update their probability

$$p_{new}(wi) = p_{old}(w_i) \cdot p_{old}(w_i)$$

Step 5 If the desired summary length has not been reached, go back to Step 2.

Graph Based MDS

Some of the most newly developed summarizers are those that reduce the problem of summarization to graph problems, notably using the Page-Rank algorithm. Of these, the most successful application to multi document summarization was that of Erkanand Radev [10]. In their Lex Rank algorithm, each sentence defines a node in the text graph. To define edges in the graph, the cosine similarity between two sentences is computed and an edge is added between the nodes representing the two sentences if the similarity exceeds a predetermined threshold. Thus the edges are defined for sentences that share the same words. The Page-Rank algorithm is then used iteratively to compute the rank of each sentence as a function of the number of neighbors and the importance of the neighbors of each node. The iterations distribute the weight across the graph, and quickly explain that the iterative spreading of importance in the graph is similar to voting process:

Sentences from the entire graph vote for the sentences with which they share word overlap. Of course, such a voting procedure can be achieved by a direct frequency count, rather than distributing information little by little through the nodes. So the Page-Rank algorithm can be seen as a complex (unobservable) function that assigns weights to sentences based on the frequency of words that appear in the text. In order to avoid repetition, sentences that are assigned high importance, but are similar to more important sentences are not included in the summary.

In this section we discuss four graph based methods. They are

(i) Cumulative Sun
(ii) Degree of Centrality proposed by Erkan et al [15].
(iii) LexRank & Continuous LexRank methods and
(iv) Discounting Method

Cumulative Sum Method

In this method, any sentence weight is obtained by adding all the entries in the similarity matrix, corresponding to the sentence, either row wise or column wise. Being the similarity matrix symmetric row or column addition will yield the same result. The link weight can be considered as recommendation of one sentence by another and thus importance of a sentence is given by summation of link weights [16].

Degree of Centrality Method

Let us now consider degree of centrality method with a specified threshold proposed by Erkan et al. Here centrality degree" of any node is the number of edges incident on the vertex, with link weight greater than or equal to specified threshold. The idea behind this approach is to eliminate link weights which have too low values possibly noisy signals. If we choose a too high threshold the graph is not at all connected and becomes a set of islands.[16]

Lex Rank & Continuous Lex Rank methods

Each sentence in a network is considered as set of sentences. Each of these expressions, starts with arbitrary values assigned to each node in the graph, the computation iterates until convergence below a given threshold is achieved. After running the algorithm, a score is associated with each vertex, which represents the "importance" or "power" of that vertex within the graph. Each node is initially given a score of 1 / N where N is the number of sentences in each document. The lexical scores given are normalized by dividing each sentences weight with the maximum sentence weight, so that the top sentence score will be 1[15, 17].

Discounting Method

Discounting technique envisages that once a sentence is selected by any one of the methods, immediately corresponding row and column values of the matrix are set to zero [17]. Thus the next sentence is selected from contributions made by the remaining (n-1) sentences only [15]. The idea behind discounting technique is that once the sentence is selected, the

chance for repetition of information in the succeeding sentences is minimized.

There have been a number of researches and development budgets [1] devoted to automatic text summarization. The United States (e.g., DARPA), the European Community and Pacific Rim countries have identified text summarization as a critical research area, and are investing init. Text summarization is also increasingly being exploit in the commercial sector, in tele communication industry (e.g., BT's Pro Sum), in filters for web based information retrieval (e.g. Inxight's summarizer used in Alta Vista Discovery), and in word processing tools (e.g.., Microsoft's AutoSummarize). In addition to the traditional focus of automatic abstracting (of scientific and technical text) to support information retrieval, researchers are investigating the application of this technology to a variety of new and challenging problems, including multi lingual summarization, multi media news broadcasts, and providing physicians with summaries of on-line medical literature related to patient's medical record. As the information overload problem has grown, and people become increasingly mobile and information-hungry, new applications for text summarization can be expected.

Performance Measures for Information Extraction

The results of information extraction module are evaluated against three most popular performance measures: recall, precision and f-measure.

Recall is the fraction of expert summary which is present in the summary generated by the system and is given as:

$$Recall = \frac{No\ of\ Sentences\ (System\ Summary \cap Expert\ Summary)}{Total\ no\ of\ Sentences\ in\ Expert\ Summary}$$

Precision is the fraction of the sentences extracted in the system summary that are present in the expert summary and is given as

$$Precision = \frac{No\ of\ Sentences\ (System\ Summary \cap Expert\ Summary)}{Total\ no\ of\ Sentences\ in\ System\ Summary}$$

F-measure is the weighted harmonic mean of precision and recall. The general formula for F-measure is given as

$$F\text{-}Measure = \frac{(1+\beta^2)*Precision*Recall}{\beta^2*Precision+Recall}$$

We have used the traditional ($\beta =1$) F-measure for our evaluation. This is also known as the F1 measure, because recall and precision are evenly weighted.

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