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"The Application of the *Iron Triangle Model* to Enhancing the Quality of Online Higher Education during the COVID-19 Pandemic"

Abstract

During this COVID-19 pandemic, Kharazmi University, like other campus universities, is teaching some courses at a distance. Universities, like Payame Noor University, that already do distance teaching at scale, are under new pressures as the pandemic makes access to education more difficult. Moreover, all higher education institutions will likely continue to offer some online and distance (ODL) programmes in future.

The fundamental aims for education systems are to expand access, improve quality and lower costs. These three vectors of access, quality and cost can be represented as a triangle: but it is an 'iron' triangle. With conventional methods of classroom teaching it is impossible to expand the triangle and pursue these three aims simultaneously. However, using technology does make this possible. Cost-effective education of quality can be offered without exclusiveness. This paper presents guiding principles to help institutions offer ODL of quality to large numbers of students at low cost.

Good education requires students to engage in a mixture of independent and interactive learning activities. Using technology enables institutions to offer a blend of synchronous and asynchronous experiences that meet these needs while keeping costs down. The three key components of distance and online education: learning materials, student support and administration can be represented as a three-legged stool. Each leg must be strong to support the student in successful learning.

Introduction

CONFERENCE TITLE

It is a pleasure to address you today. I first landed in Teheran 42 years ago on my way to a conference of the International Council for Correspondence Education in New Delhi, India. Four years later we hosted the next conference in Vancouver, Canada, where the organisation changed its name to the International Council for Distance Education (ICDE).

Much has changed in the four decades since those events, and we can expect further changes as a result of this COVID-19 pandemic. Iran has been hit hard by this terrible disease and I express my sympathies to you all for the difficulty and grief that it has caused.

TITLE + PHOTO

I am grateful for the invitation to address you that I received from Professor Abbas Bazargan. The title that he proposed is: "The Application of the *Iron Triangle Model* to Enhancing the Quality of Online Higher Education during the COVID-19 Pandemic".

AIMS OF EDUCATION

The fundamental aims of our education systems are to expand access, improve quality and lower costs.

IRON TRIANGLE

These three vectors of access, quality and cost can be represented as a triangle: but it is an 'iron' triangle. With conventional methods of classroom teaching it is impossible to expand the triangle and pursue these three aims simultaneously. However, using technology does make this possible. Cost-effective education of quality can be offered without exclusiveness. I shall present guiding principles to help institutions offer ODL of quality to large numbers of students at low cost.

INDEPENDENT - INTERACTIVE; SYNCHRONOUS - ASYNCHRONOUS

Good education requires students to engage in a mixture of independent and interactive learning activities. Using technology enables institutions to offer a blend of synchronous and asynchronous experiences that meet these needs while keeping costs down.

THREE-LEGGED STOOL

The three key components of distance and online education: learning materials, student support and administration can be represented as a three-legged stool. Each leg must be strong to support the student in successful learning.

Let me explore these concepts in turn.

The Iron Triangle

I lead off with the Iron Triangle.

Throughout history education systems have aspired to three objectives:

CENTRAL CHALLENGE

- Access: to be as wide as possible

- Quality: to be as high as possible

- Cost: to be as low as possible

TRIANGLE

The nature of the challenge is clear when you represent these aims as a triangle of vectors.

With traditional methods of face-to-face teaching this is an 'iron triangle.

STRETCH

You want to stretch the triangle like this to give greater access, higher quality and lower costs.

But you can't!

EXTEND ACCESS

Try extending access by packing more students into each classroom and you will be accused of damaging quality.

IMPROVE QUALITY

Try improving quality with better learning resources and the cost will go up.

CUT COSTS

Try cutting costs and you will endanger both access and quality.

TRIANGLE AN INSIDIOUS

This iron triangle has hindered the expansion of education throughout history. It has created in the public mind an insidious link between quality and exclusivity. This link still drives the admission policies of some universities, which define their quality by the people they exclude.

TRIANGLE 2

But today there is good news. Thanks to globalisation successive waves of technology are sweeping the world – and technology can transform the iron triangle into a flexible triangle.

CHALLENGE

By using technology you can achieve wider access, higher quality and lower cost *all at the same time.* This is a revolution – it has never happened before.

FUNDAMENTAL PRINCIPLES

How does it work? The fundamental principles of technology were articulated two centuries ago by the Scottish economist Adam Smith. They are: division of labour, specialisation, economies of scale, and the use of machines and information and communications technology.

These principles have been applied to higher education by the distance teaching institutions, often called open universities.

MEGA-UNIVERSITIES BOOK

In 1996 in my book: *Mega-universities and Knowledge Media: Technology Strategies for Higher Education,* I invented the term 'mega-university' for distance-teaching institutions enrolling over 100,000 students.

PAYAME NOOR

At that time there were 11 mega-universities around the world and they included your Payame Noor University, that was created in 1986. Today there are some 50 open universities worldwide.

OPEN UNIVERSITY 170,000 PLUS

I shall use the example of the UK Open University, which I had the honour to head for 11 years, as an institution that has stretched the iron triangle. The UKOU, founded in 1969, was the first distance teaching university to operate at scale using modern technologies. Its purpose is

expressed in the slogan 'open to people, open to places, open to methods and open to ideas'. Since its creation over two million learners have taken modules, certificates, diplomas, degrees, higher apprenticeships, Masters degrees and doctorates. Today with over 170,000 students and 13 million learners visiting OpenLearn, its free online course platform, the UKOU has dramatically widened access.

QUALITY ASSESSMENT

It also offers high quality. England's Teaching Quality Assessment system ranked the Open University 5th out of 100 universities and it topped government surveys of student satisfaction for several years running.

LOWER COSTS

It did this while operating at lower costs per student and lower costs per graduate than conventional universities.

So what is the secret of doing open, distance and online learning so successfully?

TWO DYADS

I suggest that the secret is to offer students a blend of two types of study. You can use two names for them Independent Study and Interactive Study, or Synchronous and Asynchronous study. These two pairs are not exactly the same but they are closely related as we shall see, and I think it's useful to distinguish between them.

I start with Independence and Interaction.

SIR GEORGE WILLIAMS

At the beginning of my career, while I was teaching at the École Polytechnique of the Université de Montréal, I enrolled in a part-time Master's course in Educational Technology at what was then Sir George Williams University. The whole experience was very formative and enlightening, but the highlight was the three-month internship that the programme required. This was a life-changing experience.

UKOU 1972

I spent it at the UK Open University, which I've just mentioned. The UKOU was then in its second year of operation but it already enrolled 40,000 students. By the time I re-joined it as vice-chancellor, 18 years later, it had 100,000 students and when I left there to go to UNESCO in 2001 the numbers had grown to 200,000. You will understand why I believe that distance learning and scale go together naturally!

OPEN TO PEOPLE, PLACES, METHODS, IDEAS

But the real issue is access. The UKOU was launched with the slogan 'open to people, open to places, open to methods, and open to ideas'.

What was really radical in the UK of those days was that the UKOU interpreted 'open to people' to mean having no academic prerequisites for admission. The basis for admission was 'first come, first served' up to the numbers that the university could cope with. The cautious civil servants in London, who were frightened by this radical proposal, had recommended to the first vice-chancellor, Walter Perry, that he start with a pilot project of 300 students to test the concept.

PERRY 25,000

But Perry, knowing that the success of the Open University would depend on economies of scale and the high-quality offerings that scale permitted, ignored the civil servants and admitted a first class of 25,000 – and another 15,000 the following year.

ELONGATED TRIANGLE

This is the Iron Triangle at work. Technology makes it possible to increase quality and access at lower costs if you work at scale.

Scale means wider access. But the social mission of an open university requires that it must be wider access to **successful** study, not just wider access to **begin** studies. Open admission attracted thousands of adult students with lots of motivation but weak school results, often people whose bad memories of school made them very nervous about undertaking higher education.

So what did the UKOU do to help thousands of learners overcome their fears of failure and achieve success?

OU-BBC PARTNERSHIP

At the time of its creation in the 1970s, the UKOU was most famous for its partnership with the British Broadcasting Corporation, the BBC, which put out course-related TV and radio programmes on its regular channels. This led to jokes about 'earning a degree by watching television'. In fact these programmes represented only a small part of the teaching/learning system. But unfortunately the broadcasts gave the impression that the UKOU was offering one-way teaching for independent learners.

BLUE PLANET

Today the UKOU-BBC partnership continues but focuses on blockbuster general programming for a global audience. Since the 1970s the arrival of computers and the internet have provided the UKOU with many more ways of reaching students.

The UKOU understood from the beginning that many of the learners who came through its open doors would require interaction with teachers and other students in order to succeed.

TUTORIALS

So the University made large investments in providing a part-time tutor for each group of 25 students. It rented study centres all over the country where these tutors could organise optional tutorial sessions and interact with the students who wished to attend. The tutors also commented

extensively on the students' assignments when they marked them, with staff on the main campus monitoring the quality and helpfulness of the commentary and the appropriateness of the marking. This is a massive operation. At the time I left the UKOU we had close to 10,000 tutors, whom we called associate lecturers, working for us in this vital function.

INDEPENDENCE AND INTERACTION

I've given just two examples of components of distance learning. TV and radio programmes allow students to learn independently. Face-to-face meetings between students and tutors are opportunities to learn through interaction with others.

GETTING THE MIXTURE RIGHT

Designing any good learning system means creating a judicious mixture of independent and interactive activities. This is particularly important in distance education. The mixture you choose will depend on the media and facilities that you have available but also on your resources. A simple rule is that, if you have lots of students, independent activities, such as TV and audio programmes and working on websites have much lower unit costs than interactive activities with other people. But most students require both, which is why you need a balance.

INTERACTION A SLIPPERY CONCEPT

Perhaps we can return to this in discussion because interaction is a very slippery concept and I've presented it rather quickly.

BORJE HOLMBERG

Borje Holmberg, the great scholar of correspondence education, called it 'a guided didactic conversation'. He distinguished between the independent activity of studying correspondence texts and then creating interaction with the tutor by submitting an assignment by post and getting it back sometime later with their comments. Today some would reserve the term 'interaction' for exchanges that are immediate and in real time. For instance, do you consider that an automated telephone response system is interactive? What about websites with frequently asked questions?

Rather than getting too fussy about how you define interaction I suggest you focus on two things: the cost of providing the activity and its effectiveness for the learner. It is said that beauty is in the eye of the beholder. By analogy, the best judge of whether any learning event is interactive is whether the student judges it to be interactive. Do students get answers to their questions that are specific to them? Do the commentaries and marking of their assignments indicate that another human being has engaged with their work?

DYADS

My second dyad, which is the distinction between synchronous and asynchronous activities, is a useful complement to independence and interaction.

I find it interesting to compare two manifestations of online learning using this yardstick.

CAMBRIDGE

Earlier this year universities around the world had to move quickly to online learning. What most did should really have been called emergency remote teaching. Instructors gave their previous classroom lectures online, through Zoom and similar platforms, in a synchronous fashion - what we also call 'real time'. The quality was not wonderful but it seemed to work, especially if institutions invested in other two other components of successful distance education, good logistics and effective administration. I will come to them in a minute.

MOOCS

That was one manifestation of online learning. The second is MOOCs (Massive Open Online Courses). These created a sensation when they first appeared a decade ago. As often happens with innovations in educational technology they were over-hyped and misunderstood. Some newspaper articles said it was the end of higher education as we knew it. They predicted that a few star professors would displace most of the world's faculty and everyone would learn from home.

In the event, not much in traditional higher education seemed to change, although millions of people now take MOOCs. I've done 20 myself and could only take them because they allow me to study asynchronously. I can study them when I want to and progress at the pace that suits me.

OPENLEARN

COVID-19 has given a terrific boost to asynchronous free online courses. In the UK one in seven adults started one this year, including 32 per cent of those who had lost their jobs, 20 per cent of those who had been given temporary leave and 22 per cent of 18 to 44 year-olds.

The UKOU's OpenLearn platform hosts almost a thousand free on-line courses and in the past year has seen a record 13.6 million visitors, up from 8.9 million the year before.

INDEPENDENCE & INTERACTION; SYNCHRONICITY & ASYNCHRONICITY

As we move out of the first stage of the educational response to COVID-19, when we 'crashed into online learning', and into the second – the new normal, whatever that will be – these pairs of concepts, independence and interaction and synchronicity and asynchronicity, are particularly important.

Increasing access to education means allowing learners to so some of their study independently, which usually means materials that can be used asynchronously. But making that education effective, for most people, means giving them opportunities for interaction with other people, sometimes, although not always, synchronously.

In talking about the three-legged stool I listed various other functions that are necessary in for an effective online and distance learning system that can foster student success. Each of these activities can be situated somewhere on the spectrum between independence and interaction.

The Three-Legged Stool

THREE-LEGGED STOOL

I now bring this all together in my second conceptual trio, the three-legged stool.

Think of the student learning online as seated on a three-legged stool. The three legs are:

1. Good learning materials: for both synchronous and asynchronous use.
2. Student support: academic, administrative, cultural and social.
3. Efficient administration and logistics.

A stool requires all three legs to support the weight put on it. By analogy, online education only works if all three functions are performed well. If any leg cannot support the weight the student may fall – that is to say fail.

STOOL - LEARNING MATERIALS

Learning Materials

In this year's rapid transitions to online learning, most effort was invested in learning materials. Professors concentrated on putting their classroom lectures online for synchronous delivery.

Good learning materials are, of course, vital to successful distance learning. But also, good materials that students can work on **asynchronously** are a vital complement to **synchronous** online lectures. I've just talked about this.

So now, I shall focus on the other two legs of the stool.

ACSENDA TRANSITION

During the scramble to go online when COVID-19 hit, I saw how a small, private university institution in Vancouver, the Acsenda School of Management, made the transition successfully. It went well because, although the learning materials were mostly synchronous Zoom presentations, Acsenda also gave intense attention to both Student Support and also to Administration and Logistics.

You can find details about Acsenda's successful transition and the leadership challenges behind it in the publications and presentations on my website.

Student Support

STOOL - STUDENT SUPPORT

So what do I mean by Student Support?

Students need support that goes beyond their online group sessions with the professor. Four areas where they may need support are: academic, administrative, cultural and social.

STUDENT SUPPORT 4 ELEMENTS

To be successful students must engage with the **academic** content of their courses. Many require more help than they get in the formal online classes. Their first need is for opportunities to ask questions and to be questioned about their understanding of concepts. This can be done by the

instructor in one-on-one or small-group online sessions. For a large class it is probably done better by part-time tutors hired and trained specifically for the support function.

The second area is **administration.** When they are on campus, students can usually resolve problems about timetables, programme requirements, and so on by going to the relevant office. When everyone is off campus this support must be provided through clear information on websites, a friendly helpline, regular e-mail updates, and quick and accurate replies to a large volume of e-mail.

Then there is **cultural** support. Undergraduate students, in particular, look to their campus for exciting cultural activities and for meeting other students. On campus these often happen informally, but a university operating online has to organise them, which means using technology to offer events such as trivia quizzes, music nights and debates. At Acsenda the student ambassadors, who are specially chosen high-performing senior students, organised some very successful cultural events.

Finally, there is **social** support. Online study and confinement during lockdowns can be lonely, particularly for new students. They need opportunities to meet each other, if only virtually, and to talk about any personal issues that worry them. Each university has to decide where to draw the line between the providing social support itself and making referrals to official psychological and counselling services that some countries provide through the state or voluntary organisations. Universities should not take responsibility for student issues that should properly be dealt with by state or community social services.

Administration and Logistics

STOOL - ADMINISTRATION AND LOGISTICS

The third leg of the stool is administration and logistics.

ADMINISTRATION & LOGISTICS LIST

Some of this will be provided by the **learning management system**, which must be as user-friendly as possible.

For the **online classes** Acsenda trained faculty to use both Zoom and BigBlueButton. It was good to have two options because, when institutions switched to emergency remote teaching earlier this year, there was so much pressure on these platforms that they did crash. Most of our Acsenda teachers preferred Zoom but it was good to have a back-up. Nothing puts students off distance education faster than systems that don't work, because it makes them feel totally helpless.

Effective online operations depend on having an efficient **registry** with student management policies that have been translated into smoothly working procedures. This means user-friendly IT systems but also **telephone helplines** for students with problems that they may prefer to discuss with a real person. Expect the use of e-mail to explode!

Conclusion

I will finish there and see if you have any questions. I have presented four sets of concepts which are keys to understanding the 'why' and the 'how' of online and distance education.

IRON TRIANGLE

The **iron triangle** shows us *why* technology is can have a revolutionary impact on education.

DYADS

The complementarity of **independent and interactive study** and **synchronous and asynchronous teaching** show us *how* to develop good pedagogy.

THREE-LEGGED STOOL

The analogy of the **three-legged stool** brings it all together as a model for successful online and distance learning system.

THANK YOU