

Rural Distance Education Technologies and Programs



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Main Points



- Research shows that interactive computer-based instruction is:
 - More effective
 - More efficient
 - More cost-effective
- There is a quiet revolution in E-learning that has tremendous development potential

Learning Benefits of Internet



- Cost effective
- Just-in-time
- Learner controlled
- Self-paced
- Interactive
- Accessible worldwide

Learning Benefits of Internet



- Uniform content
- Customizable content
- Content updated rapidly

Potential for Development



- Empowers individuals to take control of their own learning - for whatever their learning needs are, anywhere, anytime.

Why Technology-Based Instruction?

- **On average, tutored students score better than 98% of classroom students.**

**Classroom
Students**



**Tutored
Students**

Potential for Individualized Interactivity

- Avg # questions teachers ask in class - 3
- Avg # questions asked by one student during one classroom hour - 0.11
- Avg # questions asked by student and answered by tutor during tutorial hr. - 21
- Avg. # questions asked by tutor and answered by student during tutorial hr. - 117

Meta-analyses of Research on Computer-Based Learning

- Technology-based instruction - ES 0.35 = raising achievement of 50th percentile students to 64th percentile (1994)
- Interactive multimedia instruction - more elaborate interactions - ES 0.50 = raising achievement of 50th to 69th percentile
- Intelligent tutoring - mimics one-on-one dialogue that occurs in tutorial interactions - ES 0.84 = raising from 50th to 80th
- Recent intelligent tutoring systems (1995) - ES 1.05 = raising from 50th to 85th

Reduces Variability in Achievement - Increases Fairness



- Greater variability in learner achievement in conventional instruction than with interactive multimedia instruction - despite overall increase in relative mean achievement scores of about 0.50 SD in interactive multimedia instruction.

Percent Time Savings for Technology-Based Instruction

Study	# Findings	% Time Saved
Orlansky & String (1977)	13	54
Fletcher & Capper (1991)	8	31
Kulik (1994 - Higher Ed)	17	34
Kulik (1994 - Adult Ed)	15	24

Potential for Cost Savings



- Average of 30% reduction in time to mastery of instructional objective.
- DoD contractors for technology-based instruction bid on estimates of 50% reduction
- Noja (1991) reported 80% time savings for Italian Air Force training

Estimated Cost Savings in Military Setting

- DoD spends \$4 billion per year on training
- Reducing time to train 20% of trainees by 30% saves \$250 million annually
- Reducing time for 60% of trainees by 30%, saves over \$700 million

Estimated Cost Savings in K-12 Setting

- Costs to raise math scores by 1 SD
 - Peer tutors (20 min day) \$ 427
 - Adult tutors (20 min day) \$2,404
 - CAI (1990) (10 min day) \$ 300
 - Incr. Instructional day (30 min) \$3977
 - Reduced class size
 - 35 to 30 \$1,466
 - 35 to 20 \$2,039

Caveats

- Not all computer/Internet-based instruction results in better learning
- Factors influencing quality of instruction and achievement outcomes:
 - quality of graphics
 - clarity of instructional text
 - verisimilitude of simulations
 - relevance of tutorial advice
- **TECHNOLOGY DOES NOT GUARANTEE EFFECTIVE LEARNING!**

The E-Learning Revolution

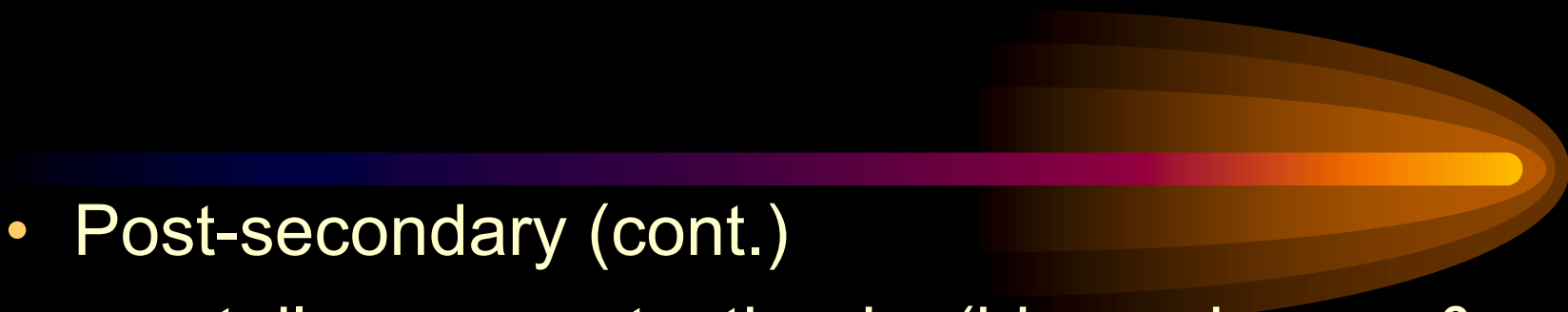


- Investment firms recommend investing in E-learning as a growth sector
- “Education over the Internet . . . will make e-mail look like a rounding error.” (John Chambers, CEO of Cisco)
- “However significant the impact on the consumer and business markets, we believe that the Internet will have the greatest influence on the process of learning - e-learning will change our lives.” (SunTrust Equitable Securities)

E-learning Markets, Products, Services & Providers



- K-12
 - libraries of online curricula (ChildU)
 - tutoring support (Tutornet)
- Post-secondary
 - preparation for IT certification (DigitalThink)
 - learning service providers (Apollo Group)
 - learning platform & knowledge hub (Blackboard.com)

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- Post-secondary (cont.)
 - e-tailers - e.g., textbooks (bigwords.com & eCampus.com)
 - online communities (Student Advantage, College 411, College Club)

Corporate E-learning



- Greatest growth in E-learning markets
- Enhances competitiveness
- Use of knowledge management increasingly critical for both customers and employees
- More cost-effective - reduces travel expenses and time away from work

Lifelong Learning Market



- Employability skills
- Financial growth skills
- Personal enrichment

Knowledge Hubs



- One-stop shops
 - Robust content
 - Links to reputable distance education providers
 - Broad array of e-tailing choices

Market Size



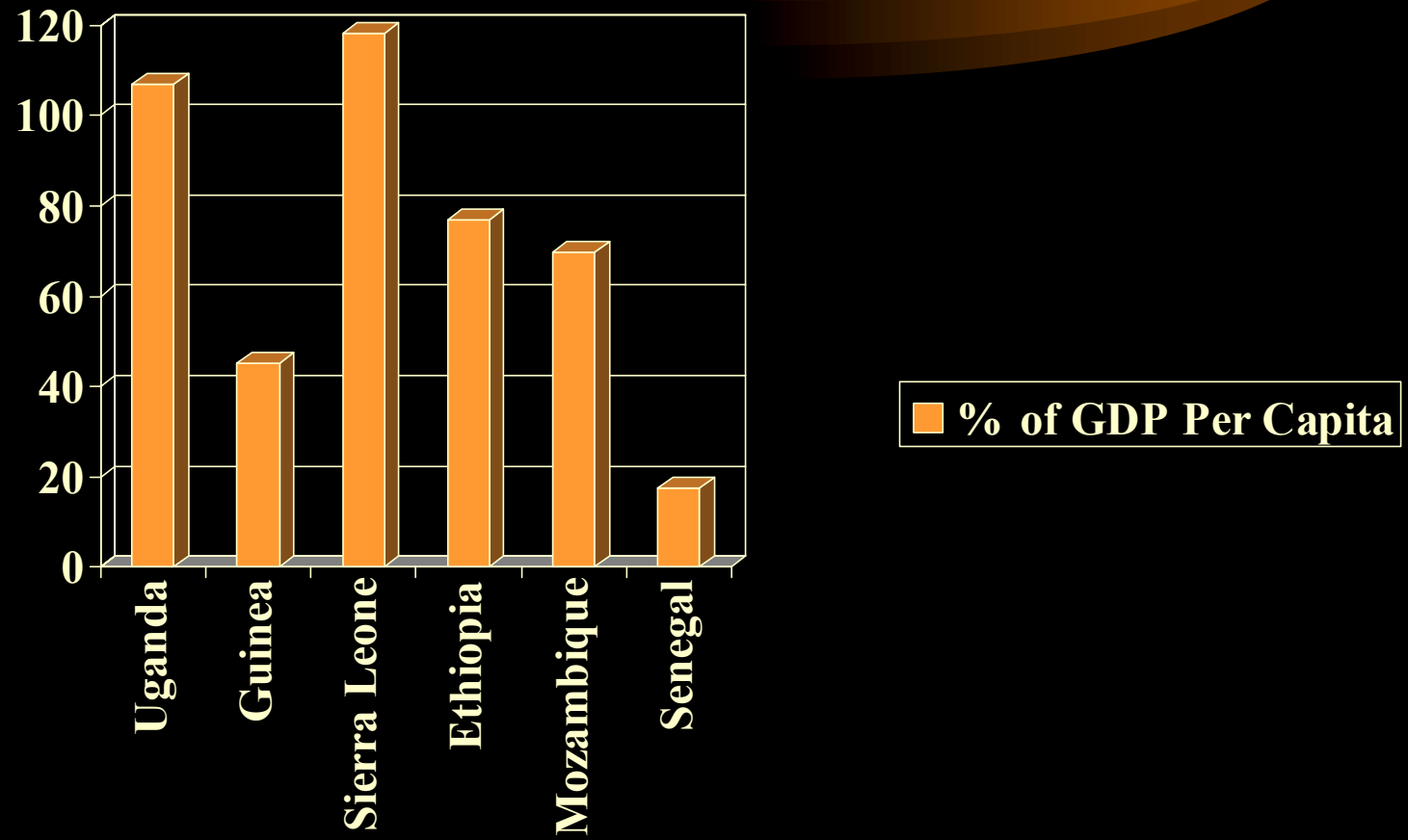
- More than \$700 billion in US alone
 - Pre-K-12 \$382 billion
 - Post-secondary \$233 billion
 - Training \$103 billion
 - Lifelong learning \$25 billion
- More than \$1.2 billion in private capital distributed to e-learning companies and more than \$302 million in public equity raised during 1999.

Restrictions for E-learning in developing countries

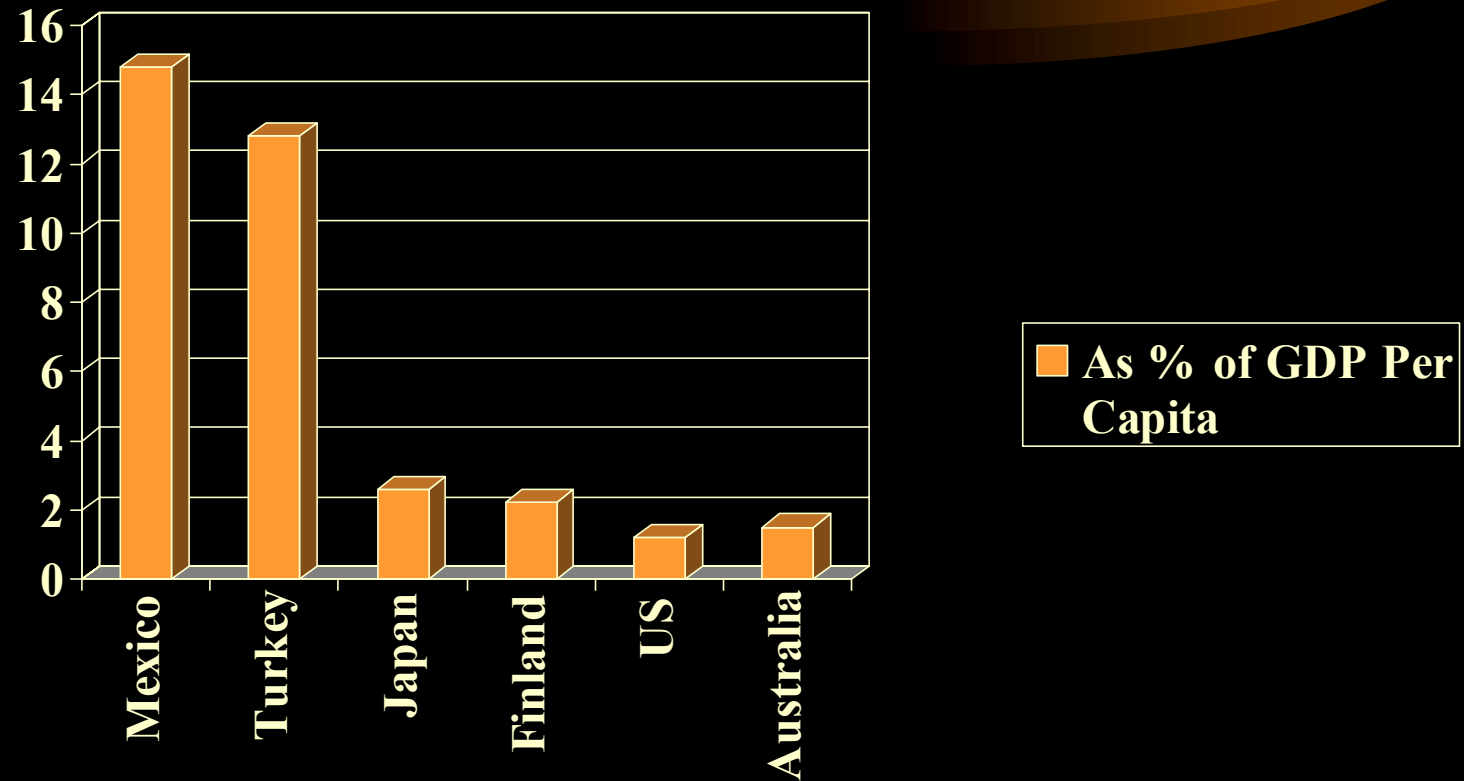


- Limited information infrastructure
- Limited IT capacity
- High costs of Internet connectivity relative to income
- Costs of online courses
- Credit-card payment for courses

African Internet Monthly Access Charge - US\$



OECD Internet Monthly Access Charge - US\$



Solutions



- Increase affordable Internet access
- Set up community learning centers (CLCs)
 - Primary purpose - access to learning
 - Serve multiple audiences/sectors
 - Staffed by learning librarians/facilitators
- Obtain agreements by E-learning providers for reduced rates for developing countries
- Establish international payment schemes