

Computer Games and Developing Countries: *A Research Agenda*

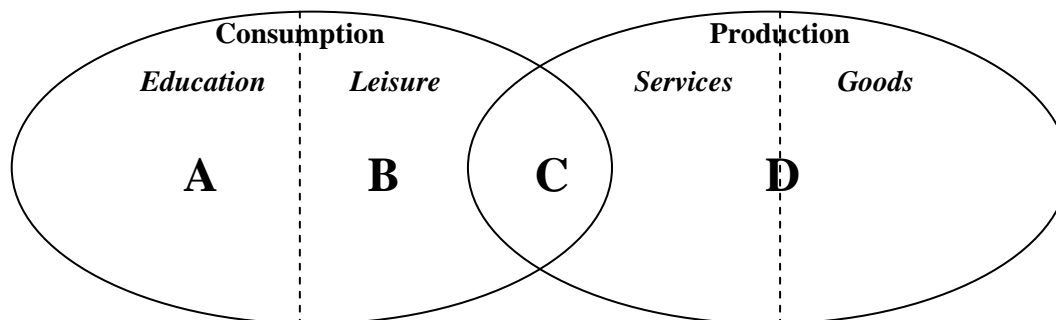
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Tens of millions of people in developing countries play computer games on a regular basis. Computer games companies in developing countries employ tens of thousands and earn tens of millions of US dollars annually.

Yet you would hardly know it from the research literature, which seems to have almost wilfully ignored this area.

We can characterise the relation between games and development through the following diagram. Each element will be discussed in turn, covering key background, questions, and frameworks for research:



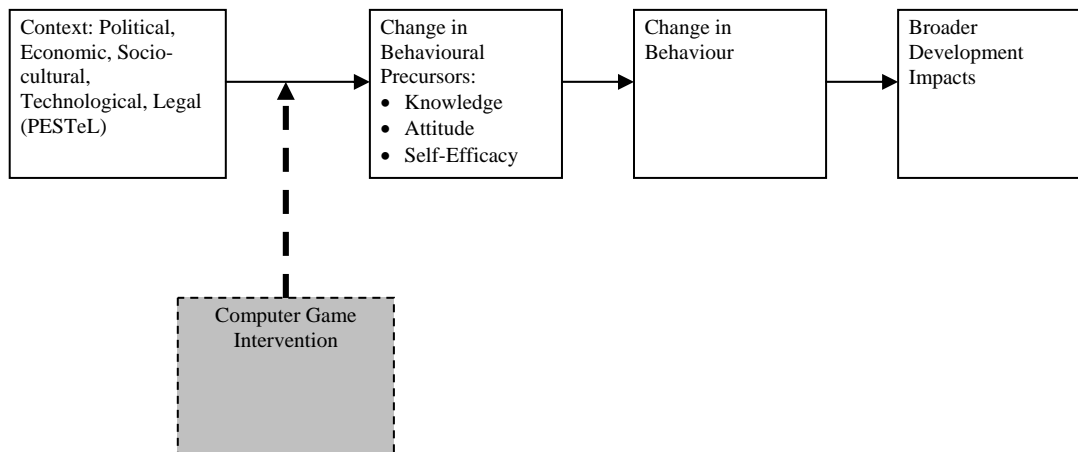
A. Learning Through Games

As the ICT infrastructure in developing countries grows, and as exposure to and engagement with leisure gaming grows, then so too will the use of computer games for educational purposes. We see this most obviously in schools for teaching basic literacy/numeracy skills (e.g. Pawar et al 2006) and for knowledge-building in other areas (e.g. biology – IES 2006). There is no sharp line to divide educational from leisure use. Thus development actors are seeking to utilise "fun" games to deliver development outcomes. For example, games on mobiles are being used in Asia and Africa to raise awareness among young people about positive and negative HIV/AIDS-related behaviours (Changemakers.net 2007).

There is a small body of work on the use of games in both formal educational and informal social welfare contexts, but nothing systematic. In particular, research is needed on the educational impact of games, partly with a view to the different forces at play in a developing country setting compared to a Western setting. Research is also needed on the comparative impact of different interventions, building on Linden et al's (2003) finding that those using games showed better maths test improvements

than those who did not, but that spending money instead on additional face-to-face instruction was more cost-effective than using a computer game.

Potential frameworks for research include cost-effectiveness analysis, looking at the costs of different ways to improve the development of particular measurable skills. As a general framework, one can also adapt the communications-for-development model in order to assess the impact of games on behaviour (adapted from Bertrand et al 2006):



B. Games Playing

Though constrained by factors such as game availability and awareness, time, income and bandwidth, those who access telecentre/cybercafe facilities and those who access mobile phones increasingly use that access to play games. Thus, for instance, unless blocked, games playing seems to always appear in the top three uses of telecentre and cyberkiosk facilities (e.g. Kiri & Menon 2006; Huerta & Sandoval-Almazin 2007).

Yet there appears to be very little data, let alone direct research, about this activity. We can break down the need for data and research into a fairly basic set of questions:

- Who is playing?
- When and where are they playing?
- Why are they playing?
- What are they playing?
- How and with whom are they playing?
- What impact does their play have?

Different frameworks can be used for different questions. To address the question of motivation for play, for example, one could use Yee's (2005) model of achievement, social and immersion motivations; perhaps coated with a layer of institutional theory to better understand the specific forces that shape behaviour of developing country players in differing contexts. To address the question of the impact of play, one could make use of Sen's (1999) capability framework. This could be a useful way to consider the balance between the perceived negative (time-wasting, addiction) and positive (capacity-building, relationship-forming) aspects of games play. Alternatively, one could look at the broader impact of games; for example, using

economic and social impact assessment to judge the effect of access to games-playing on telecentre sustainability.

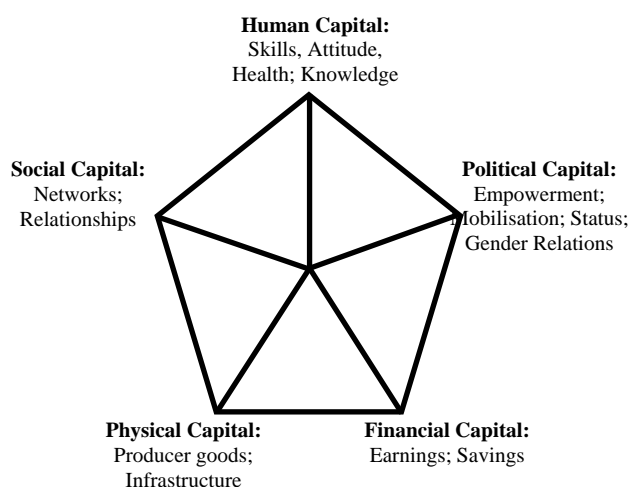
C. "Playbouring"

In a number of MMORPGs (massively multiplayer online role-playing games, such as World of Warcraft and Lineage II), the distinction between consumption and production is blurred. One aspect has been the emergence of "playbourers": tens of thousands of gamer-workers based in developing countries who are paid to play the game. They may play to produce special in-game items (e.g. a powerful potion or armour), or to produce in-game currency (hence the widely-used term "gold farmers" to describe this group), which are then sold for real-money to "regular" players. Or they may take over another player's character and work to increase its power (its "levels") within the game; again for money.

Despite a rash of interest in this activity, especially in 2005 when gold-farming stories were carried by most Western media, there has been very little systematic research. We know most playbourers are based in China but they are also reported working in other East and South-East Asian nations, and in Central America (Jin 2006). A flow of good survey data is needed although a best guess is that some 400,000 playbourers work to feed a market of millions of consumers worth at least US\$500m per year (Heeks 2008).

There is some limited sense of the earnings and working conditions of gamer-workers from basic field work undertaken in 2005 but this needs to be updated and expanded. Research is also needed on the broader impacts of playbouring, including the career and enterprise progression curves of those involved.

A good framework for assessing the impact on individual developing country workers would be the livelihoods framework; for example a modified assets pentagon (see below – from Heeks 2006). We can also better track the connections from developing country worker to (typically) industrialised country consumer using value chain analysis.



D. The Games Industry

The activities of the IT industry overall in developing countries are well-known; from hardware production in Malaysia and Taiwan to software production in India and China to IT services in Brazil and South Africa. But on this broad stage, the spotlight has rarely fallen on one sub-sector – the games industry.

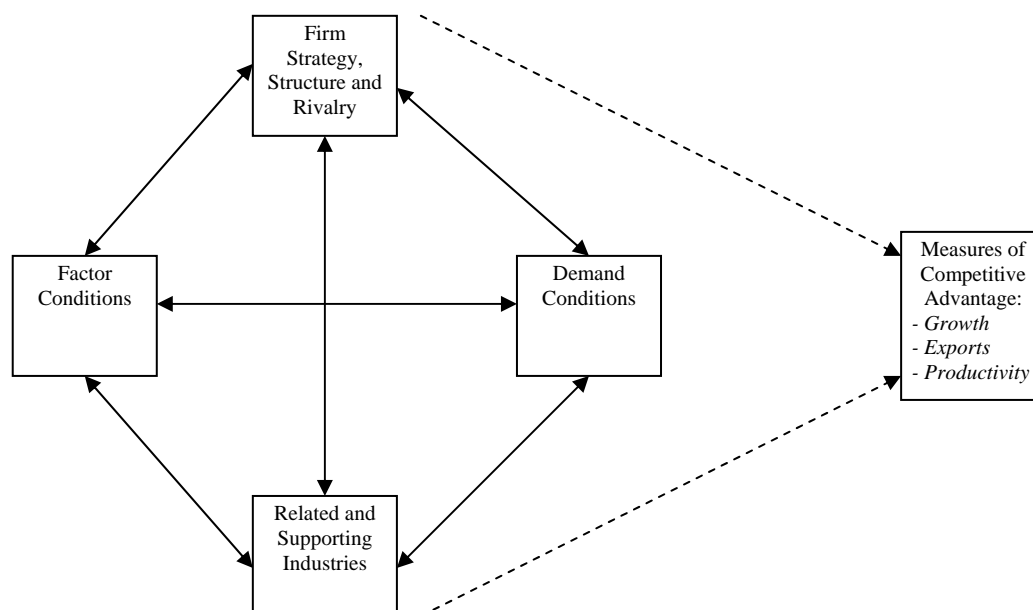
In toto, that industry covers goods (hardware such as games consoles), services (such as the playbouring just described) and plenty in-between such as the software of the games themselves. Global sales of hardware and software alone were US\$33bn in 2006 (Datamonitor 2007; Nasscom 2007).

Developing countries appear to have a hand in all these elements. Perhaps best known is the East Asian games industry covering games developers, and also distributors publishing games from foreign firms. There is also outsourcing of game development. Global games outsourcing was estimated at US\$1.1bn in 2006, with 60% of Western game studios involved (MacQueen & Gibson 2006). Work is undertaken in locations such as India, China, and the Philippines, each earning some tens of millions of US dollars-worth of export work.

Because developing countries are only recently coming into an outsourcing business previously small and previously dominated by Eastern Europe, little research has been undertaken. Obvious research questions will relate to:

- **Policy:** what government needs to do to support games industry growth.
- **Strategy:** what local games firms need to do to gain business, to stay competitive, and to move up the value chain.
- **Tactics:** identifying good practice in games development and outsourcing.
- **Impact:** assessing the developmental impact of the games industry.

Each of these research issues could draw on different frameworks. For example, research on policy and strategy could use Porter's (1990) "diamond" model (see below). Alternatively, Gereffi's commodity chain model could be used to help understand aspects of strategy, tactics and impact (e.g. Grantham & Kaplinsky 2005).



References

- Bertrand, J.T., O'Reilly, K., Denison, J., Anhang, R. & Sweat, M. (2006) Systematic review of the effectiveness of mass communication programs to change HIV/AIDS-related behaviors in developing countries, *Health Education Research*, 21(4), 567-597
<http://her.oxfordjournals.org/cgi/reprint/21/4/567>
- Changemakers.net (2007) *Freedom HIV/AIDS: Mobile Phone Games to Create HIV/AIDS Awareness in Asia and Africa*, Changemakers.net, Arlington, VA <http://www.changemakers.net/en-us/node/1871>
- Datamonitor (2007) *Games Consoles: Global Industry Guide*, Datamonitor, London
- Grantham, A. & Kaplinsky, R. (2005) Getting the measure of the electronic games industry: developers and the management of innovation, *International Journal of Innovation Management*, 9(2), 183-213
- Heeks, R. (2006) Social outsourcing: creating livelihoods, *i4D*, IV(9) - September, 17-19
<http://www.i4donline.net/articles/current-article.asp?articleid=800&typ=Features>
- Heeks, R. (2008) "Gold Farming": Current Analysis and Future Research on Real-World Production in Developing Countries for the Virtual Economies of Online Games, Development Informatics Working Paper, IDPM, University of Manchester, UK
<http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/index.htm>
- Huerta, E. & Sandoval-Almazan, R. (2007) Digital literacy: problems faced by telecenter users in Mexico, *Information Technology for Development*, 13(3), 217-222
- IES (2006) *Producing Learning Gains in One-Computer Classrooms in India*, International Education Systems, EDC, Washington, DC <http://ies.edc.org/news/articles.php?id=210>
- Jin, G. (2006) Chinese gold farmers in the game world, *Consumers, Commodities & Consumption*, 7(2)/May <https://netfiles.uiuc.edu/dtcook/www/CCCnewsletter/7-2/jin.htm>
- Kiri, K. & Menon, D. (2006) For profit rural kiosks in India: achievements and challenges, *i4d*, June
<http://www.i4donline.net/articles/current-article.asp?articleid=700&typ=Features>
- Linden, L., Banerjee, A. & Duflo, E. (2003) *Computer-Assisted Learning: Evidence from a Randomized Experiment*, Poverty Action Lab, Massachusetts Institute of Technology, Cambridge, MA
http://www.povertyactionlab.com/papers/banerjee_duflo_linden.pdf
- MacQueen, D. & Gibson, R. (2006) *Outsourcing in Next Generation Games Development*, Screen Digest, London
- Nasscom (2007) *Animation and Gaming India 2007 Overview*, Nasscom, New Delhi
<http://www.nasscom.in/Nasscom/Templates/CustomEvents.aspx?id=51911>
- Pawar, U.S., Pal, J. & Toyama, K. (2006) Multiple mice for computers in education in developing countries, in: *Proceedings of the 1st IEEE/ACM ICTD Conference*, 64-71
http://tier.cs.berkeley.edu/docs/ict4d06/multiple_mice-jp.pdf
- Porter, M.E. (1990) *The Competitive Advantage of Nations*, Macmillan Press, London
- Sen, A. (1999) *Development as Freedom*. New York, Knopf
- Yee, N. (2005) Motivations of play in MMORPGs, *Daedalus*, 3(2)
<http://www.nickyee.com/daedalus/archives/pdf/3-2.pdf>