GAMES\(^1\) AND CAPACITY BUILDING

Background Discussion Note to WBI Seminar:
“Serious Play and Urban Planning - Introducing Educational Games in Capacity Building”
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This paper reviews the application of games in training and explores the potential of “Serious Play” in delivering augmented learning and capacity building programs through the World Bank Institute (WBI).

Studies indicate that the value of play provides distinct advantages in guiding the design of interactive multimedia learning environments for children and adults (Lloyd Rieber, 1998). Although there are numerous instances where computer and non-computer games have been used as educational tools in schools, little has been documented about the use of games in training practitioners. With a primary focus on urban planning, this paper attempts to take stock of some of the educational games that have been developed specifically and used successfully by development agencies and universities in training professionals.

WHY GAMES?

To start off, there is no debating that games are ‘fun’. People are motivated to spend enormous amounts of time playing games – be it a board game or a computer game – since most are engaging, challenging and entertaining. Throw in themes like city building, environmental management, health or social change, factual information and reality simulations of ‘if this – what then’ outcomes, and we have games that have the potential to build awareness about a topic, educate an audience and at the same time be fun. So, should development professionals be having fun while being trained on serious subjects (policy reform, poverty alleviation, anti-corruption, gender equality, slum improvement, provision of basic services) while aiming to assist millions of poor people in developing countries? Yes, say learning specialists who advocate that learning by playing games (also known as ‘serious play’\(^2\)) engages people interactively, enhancing participation by giving learners tangible, interesting and easy-to-relate to activities.

While it is argued that effective learning is gained through a combination of elements – skilled instructors, dedicated study, good learning materials, and improved delivery, games contribute by helping people learn processes. A playful ‘trying out’ of reality promotes the learning process by reflecting realistic problems of decision making. Games give players the opportunity to learn by simulating reality and going through the process of solving real life issues and seeing results without the associated risks of real life consequences.

Games:

- *Complement “traditional” training*: games can never replace traditional training but they can enhance a learning experience by providing the right amount of learner motivation. Games and interactive strategies appeal to the adult mind and when combined with

\(^1\) Note: for the purposes of this paper the term “games” refers to both computer and non-computer games.

\(^2\) Lloyd Rieber at the University of Georgia refers to such interactive learning environments supported by games and simulations as ‘Serious Play’. Wherein a person is “motivated to dedicate substantial amounts of time learning while finding the learning process (not just the learning outcomes) satisfying and rewarding” (Rieber, Smith & Noah, 1998)
debriefing discussions, they could provide a powerful balance to formal face-to-face training sessions. Games can be used in combination with traditional instructional approaches – face-to-face courses, small classes or group based learning workshops - to either introduce a topic area and build awareness about an issue or be used to move participants from the concepts to action learning. This is not to say that games haven’t been used in traditional training and workshop settings before; however these have been predominantly ad hoc in nature. A more structured approach to developing educational games for capacity building will ensure consistency of learning experience and quality of the educational game elements.

- **Supports “action learning”**: A recent study carried out by the WBI Evaluation Group found that ‘action learning’ proved to increase the effectiveness of WBI learning programs since they were evaluated by learners/participants as interactive, dealt with an actual project or problem, built team effectiveness and developed leaders. Since games are designed to be interactive - encouraging players to make decisions, develop strategies, solve problems, manage resources and collaborate - they lend themselves well as action learning tools in a training environment. Table 1 illustrates how playing games simulate traditional action learning philosophies.

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<tr>
<th>Elements of Action Learning</th>
<th>Characteristics of a Game</th>
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<tr>
<td>• problem identification or challenge</td>
<td>• Goals/challenges</td>
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<tr>
<td>• collaboration</td>
<td>• Interactive and demands participation</td>
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<tr>
<td>• team problem-solving</td>
<td>• depends on decision making to solve problems/challenges</td>
</tr>
<tr>
<td>• formulate action plan or strategy</td>
<td>• all about strategizing</td>
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<tr>
<td>• implement action plan</td>
<td>• encourages resources management</td>
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<tr>
<td>• team reflects of problem-solving process to gather lessons learned</td>
<td>• simulates reality, displays consequences</td>
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<td>• facilitators assists in identifying lessons</td>
<td>• induces role playing</td>
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<td></td>
<td>• encourages learning</td>
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- **Scalability – from novice to experts**: Games can be designed and developed for varying levels of proficiency. The modular nature of games allow for developing a basic version - used merely to build awareness at the community level on development projects for example, or be scaled up through the provision of game extensions and expansion packs to train professionals and experts already knowledgeable on a specialized topic. In both cases the instructional goal of the game, the target audience and the learning objectives need to be clearly spelt out before deciding on whether a computer or a non-computer game is the appropriate platform.

**TYPES OF GAMES**

Games can be categorized as per the platform upon which they are developed - computer or non-computer based, and as per their application – public involvement/participatory games, decision making games or specialized games.

**A. Categorized by Platform:**

**A1. Computer games (serious games, video games and simulations)**: Computer games developed for professional training and instructional purposes are popularly known as “Serious Games”, a term coined by the Woodrow Wilson International Center for Scholars in 2002 (See box 1). These games are intended to entertain users as well as educate and train practitioners on...
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a particular topic. The entertainment factor of serious games is that they are designed and
developed with real life simulations in mind. PlastiCity is an example of multiple player urban
planning simulation game that allows a player to redevelop a city center in the city of Bradford,
England. Players are given a range of architectural and planning tools to transform the built
environment in various ways. Madison 2000 is another computer game that was used in schools
to educate students about urban ecology by working as urban planners to redesign a down town
pedestrian mall. Players got to address city management issues –crime, budget management,
revenue generation, job creation, traffic etc. while developing a land use plan (Shaffer, Squire,
Halverson & Gee, 2004).

**Box 1. Serious Games Initiative**

Games have been developed for non-entertainment purposes for a long time, however with the
advent of new technology; a number of scholars began to examine the utility of games for
other purposes, including early work by Henry Jenkins at MIT. In 2002, the Woodrow Wilson
International Center for Scholars in Washington D.C. launched a “Serious Games Initiative”
to encourage the development of games that address policy and management issues. More
focused sub-groups began to appear in 2004, including “Games for Change” which focuses on
social issues and social change, and “Games for Health” which addresses health care
applications.

*Source: Woodrow Wilson International Center for Scholars*

**A2. Non-computer games (board games, card games and word games):** non-computer
educational games have not been a significant mass market segment, their use and sale has been
confined to schools and as a result been targeted to children. One might argue that Scrabble
and Trivial Pursuit are educational but their success is due to retailer support and mass market
promotion. Non-computer educational games are found in school supplier/publishers catalogs
designed to reflect public school curricula. Since adults are not in a comparable institutional
setting one is hard pressed to find comparable didactic tools for adults. Unlike ‘Serious Games’,
non-computer educational games have not been widely advertised as potential didactic tools for
adult learning. Nevertheless, there is evidence that board games have been used in professional
training environments and have proven effective. A number of private companies, state and
federal agencies in the United States and Canada have used non-computer games in training
their employees and in involving the public on planning, prioritizing and decision making with
regard to their development projects. The U.S Department of Energy, the U.S Department of
Transportation and its various agencies, the California Community Development Department
and the Canadian Saskatchewan Power Company are a few examples (see Box 2). The use of
games helped enhance public awareness of urban land use and transportation issues, increased
stakeholder participation on planning and project development and assisted agencies to make
investment/project decisions based on priorities set by the community.

**A3. Blended games:** Another recent area of game development that could be considered
educational are blended games or ‘Mixed-Reality Games’. These are games that use a
combination of technologies (computer simulation, web cameras etc.), classic game
components (board, markers and chips) and active people participation to simulate reality. The
Harbour Game is one such example, the game developed in Denmark employs visual tracking
and pattern recognition to superimpose information, e.g 3-dimensional models, text and
photos on physical artefacts (game board). The game was played over a board (representing
the harbor town of Aarhus) onto which physical components/ artefacts (representing
development projects) were placed. This was then captured by a webcam and transmitted onto
computer software which calculated results based on factual data and displayed it as a video
feed on a giant screen for all participants to see.
Table 2: Comparison of Different Learning Games

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<thead>
<tr>
<th>Computer Games</th>
<th>Non-Computer Games</th>
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<tr>
<td>• computer graphics are stimulating, fast changing and inviting.</td>
<td>• less costly to develop.</td>
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<td>• programming allows for individualized tracking and specialized branching.</td>
<td>• offer small group social interaction</td>
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<tr>
<td>• simulations allow for finding solutions without real life consequences</td>
<td>• board/card games are portable vs. computer stations.</td>
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<td></td>
<td>• Allow for collaboration and better group dynamics</td>
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B. Categorized by Application:

**B1. Public Involvement and Participatory Games:** Most games particularly non-computer games allow for social interaction and collaboration. Games have been used in workshop settings and class room based training to encourage professional to apply what they’ve learned by sharing experiential knowledge and by recalling facts about a subject or a project. Computer games have lent themselves less to participatory applications, although one can argue that the advent of sophisticated online computer games provides elements of participation and collaboration. However, these still fall short of providing the face-to-face social interaction that is sometimes required in a workshop or small group capacity building environments. Blended games (having both technical and non-technical aspects); the *The Harbour Game* for example has proven to very compatible and successful in creating a participatory environment. Designed as a debating game for urban planning, the game play allowed for active interaction and collaboration between both urban experts and community members. In a another example, a transportation planning board game called *Citizen Lane* was used to train employees on public involvement techniques in project development (see box 3). Public involvement games can be used to encourage the public to participate breaking barriers between the technicians and the community while also generating positive results for a project.

**B2. Decision Making Games:** In addition to games being used to help professionals demonstrate their understanding of a technical subject, games are also used in decision-making processes. A community development department in Santa Barbara, California used a board game to encourage the public to decide on the location of different land use zones as well as learn about the development implications of their decisions though game play. While in a game used by the Triangle Transit authority in Raleigh-Durham, North Carolina, participants decided on development densities at certain growth and transportation nodes in the region. By making choices about where to put development in relation to transportation, the public were able to see land use/transportation relationships, others perspectives and the implications of their decisions.

**B2. Specialized Training Games:** Games in this category are generally tailor made for a particular sector, theme or profession. These games mimic reality and provide a player with game simulations that help in scenario testing. Because of the nature of the sophistication required in such games, they tend to be more apt for the development of computer games. SimCity and Ecopolicy are some examples in urban planning. Although SimCity was not designed specifically as a ‘serious game’, it is undoubtedly one of the most influential games in urban planning. Ecopolicy on the other hand is a computer game that was specifically developed as a training tool for professionals (see box 3).

**WHAT LEARNING OBJECTIVES CAN GAMES CONTRIBUTE TO?**

With capacity enhancement as the overall goal, the World Bank Institute’s (WBI) learning activities aim to achieve the following five learning objectives\(^3\) for its clients in developing countries:

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- Raise awareness of knowledge and information;
- Build skills and knowledge;
- Influence individual behaviors;
- Enhance organizational and institutional capacity;
- Influence policy and reform.

### Box 3. Examples of Games used in Urban/Transport Planning

**Non-Computer Games:**

**Land use Planning:** A board game used by Santa Barbara, California, Community Development Department asked players to place blocks on development parcels following the allowable zoning. In a risk-free, non-threatening way, players were able to state preference for development based on their own reasons. No judgments about positions were allowed, but, through evaluating the game, it became relatively easy for participants to see that the development allowed by the existing zoning would be very dense.

**Transport Planning:** The Pennsylvania Department of Transportation (DOT) created “Citizen Lane” a board game used to train DOT employees on public involvement in project development, from preliminary design through construction. The one-hour game uses six sets of color-coded question cards for the phase of project development. The cards cover “incidents”, for example, what to do when 400 people show up at a room capable of holding 50; “issues” – questions that challenge players to deal with potential major problems in a public involvement process. The “issues” cards require the six players to brainstorm together for an answer. The questions cover material included in the DOT’s handbook on public involvement.


**Computer Games:**

**SimCity:** designed by Will Wright and produced by Maxis, the SimCity series of games are one of the most popular and influential computer simulation games that uses urban planning and the development of cities as the basis for entertainment. In SimCity players take the role of a Mayor - developing communities, building infrastructure such as roads, highways, water supply, power plants, airports, police stations, schools and hospitals, determining local tax rates, providing community facilities, zoning areas for residential, commercial or industrial use. SimCity is addictive and entertaining primarily because every action by the player generates a computer simulated impact on the city, for example, as the player constructs a city the property values keep changing thereby affecting property tax revenue, which in turn impacts the public budget. Although not intentionally designed as an educational game, due to its close resemblance to real life city management and urban planning dynamics, schools and urban planning programs have been quick to use the game as instructional tools. Teaching guides have been developed and are available online.

**The Harbour Game:** In 2002 a project team Havnen Pa Spil created a game for debating urban planning processes at the municipal level in Denmark. The goal of the game was to facilitate a debate involving all stakeholders in the urban planning process. The game was developed using augmented reality techniques and technology and was play tested in Aarhus, Denmark, with a primary focus on developing the harbor area of Aarhus. The game was played by 16 people consisting of urban planners and city stakeholders such as the Mayor, NGOs, the private sector and government. (R. Nielsen, T. Delman, T. Lossing, 2002).

**Ecopolicy:** The computer game 'Ecopolicy®' is a derivate of the simulation tool of the cybernetic management Sensitivity Model developed by Prof. Frederic Vester®. The development of the game started in 1976 as annex to UNESCO’s study 'Urban systems in crisis - Understanding and Planning Human Living Spaces by the Biocybernetic Approach'. It was followed by a cardboard game (Ökolopoly) that was chosen as 'Game of the Year' by the German magazine 'Stern'. The game served as a training tool in the workshops organized by the 'Federal Center for political education' in Bonn. 'Ecopolicy' was used successfully in management training, community politics and ecological management courses.

Taking these learning objectives as the guiding principles for designing, delivering and targeting capacity building efforts, WBI has been successful in using interactive technologies as well as blended applications of new and traditional methods to transfer knowledge around the world. WBI
and its partners deliver learning activities through videoconference, the web, print publications, instructional videos, CD-ROM, interactive multimedia and e-learning, as well as face-to-face learning events.

Although games have been explored to design interactive learning environments in WBI activities, these have mainly been one off ad hoc instances in workshops and class room type courses. For the most part these games are designed for informal group role playing activities rather than as full-fledged didactic tools for participatory, decision making and specialized capacity building and training purposes. Deriving from examples mentioned in this paper, games appear to be appropriate tools to contribute to the following learning objectives – i) raise awareness about a development area or a technical topic, ii) influence behaviors by involving the public in decision making processes and iii) sensitize people on policy issues. Games should not be expected to build skill levels, nevertheless they should be considered as useful tools that can augment traditional training methods to simulate reality, test alternatives and question decisions.

In its efforts to explore interactive technologies and methods for delivering enhanced learning experiences through its programs, it will be worthwhile for WBI to explore the value that games offer in building capacity. Given that some of thematic programs in WBI - such as the urban & local government program and the water resource management program - are introducing games and game simulations (box 4) in their capacity building offerings to clients, concerted steps should be made to structure the type and quality of learning games designed and used by WBI teams.

**Box 4. Example of Educational Games under development in WBI**

**WBI game on Street Addressing**
The WBI Urban and Local Government Program is exploring the interactive potential of learning environments afforded by non-computer games. The objective is to rely on simple interactive gaming and group/team learning techniques aimed at serving local governments which do not have reliable access to computers. A board game is being developed as a didactic tool to teach basic concepts, techniques and benefits of *Street Addressing* to urban practitioners through the concept of learning through “Serious Play”.

The mechanics of game is being derived directly from case examples of street addressing programs implemented in African cities and will adapted from the 2005 World Bank publication and manual on street addressing practices in Africa titled *Street Addressing and the Management of Cities*. The goal is to familiarize practitioners and policy makers on the benefits that accrue from a good street addressing strategy, such as improved civic identity, better management of urban information, organized street system management, efficient household waste collection, inventory of built assets, improved tax revenue, improved city services including mail and improved emergency services provision. It is hoped that while playing the game participants will also learn basic street addressing skills and terminologies. To test its potential the game will be initially played in Africa and Latin America.

**WBI simulation game on integrated water resource management**
WBIEN’s Water Program, together with a Bank team and a WBI Multi-Center team, are developing a training tool called “SIM Water” - *which is an illustrative and interactive tool for Integrated River Basin Management*. The objective of the simulation "game" is to build an interactive analytical tool to facilitate participant learning in i) multi-sectoral integrated water resources management in a river basin context, and ii) multi-riparian dialogue on a shared river basin. A user starts with a scenario - business as usual 20 years from now and explores differing scenarios under selected perspectives, through combination of different parameter input, based on real world situation, conflicts, policy changes and constraints. The user can simulate outcomes by changing parameters specific to a perspective. The simulation "game” will include guiding questions and explanatory texts, and the results can be saved and compared.
HOW WOULD ONE GO ABOUT DEVELOPING A GAME FOR TRAINING PURPOSES?

So how does one go about developing an educational game for capacity building and training purposes? There is a lot of literature available that illustrate the basic steps needed to design and develop games and one can adapt easily available guidelines to meet the design and development requirements for learning and educational games. There are essentially three broad stages – i) the pre-design stage (particularly important for educational games), ii) the game design and development stage (which includes play testing), and iii) the production and publication stage.

Pre-Game Design Stage

The following general questions help define the learning objectives of a game, the appropriate platform to select and the initial game outline - technical details required by all game designers/inventors to develop a design concept.

- **Determining the learning objective of the game:** what is the game going to teach or What will be the instructional elements/requirements of the game? Does the game relate to the overall objective of the course? Does the strategy for learning correspond with the learning objectives of the training session? Is the game going to be facilitated or will participants learn through self play?

- **Selecting the appropriate platform for the game:** Who is the target audience and what is the coverage you expect? Will the target audience have access to computers? What level of knowledge will the target audience have of the subject? Will the game be used primarily for stakeholder participation and decision making or will it be used for specialized training?

- **Developing the Game Outline:** Will teams or individuals compete? How many teams or individuals per game session? Should there be competition in the game, or will it be an ‘everyone finishes at the same time’ sort of game: i.e., no winners, no losers. Will there be more than one game in play at a time during a training session? Will a person who knows how to play the game be a part of the game group, or just an observer? Will there be a need for a facilitator? What makes the game fun? Fun is important, and cannot be minimized. What kind of game structure is needed or is it up to the designer’s imagination? How long should the game take to play? Is this game integrated into a half-day seminar (which could be interesting), or just a 20 minute ‘break’ from a power point lecture?

Game Design and Development Stage

Once a game outline has been developed and depending on the availability of funds, there are two approaches that may be considered to developing the design of an educational game:

- Hold a game design competition
- Approach a commercial game inventor or game developer

*Hold a competition for a game design (Low cost option but time intensive for staff):* To reduce costs on game design the cheapest option would be to hold a game design/development competition where interested game designers (professionals and amateurs) can enter their game ideas. Game inventors submit an idea or concept along with a working prototype which can be judged. The selected game idea is then further developed by the winning participant in consultation with the project team.

*Approach a commercial game inventor or game developer (higher cost but less time intensive for staff):* If time and not money is a constraint, it might be more efficient to hire a commercial game developer who will conceptualize, design, develop and publish the game.
Both approaches require that the games are \textit{play tested} before finalizing the design and approving it for publication.

\textit{Publication and Production Stage}

Most games that have been developed for entertainment purposes have a tough time finding the right publisher willing to publish and market their game. However, since educational games aimed at capacity building are very specific in nature and may or may not be for sale, one can approach publishers that specialize in producing educational games directly.

\textbf{CONCLUSION}

There is much to be learned about the potential of educational games and the use of serious play techniques in building individual and institutional capacity. Whatever one chooses to call them - educational games/learning games/serious games, the principle of using games for edutainment has gotten a lot of attention among learning specialists and game developers alike, however going forward there is still a need to take a more comprehensive look at the array of games and their applications in capacity building. Are certain games better in communicating or teaching a subject better than others? What development themes or sectors lend themselves better to games? Should ‘capacity games’ be facilitated for better impact? Will professionals be inclined to learn by playing? – are some of the questions that we still need to find answers to.