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11 Freedom HIV/AIDS

Mobile phone games for health communication and behavior change

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Introduction

Freedom HIV/AIDS is a mobile games-based initiative (intervention) developed by ZMQ, a Technology for Development company in India. The initiative is designed to create information, awareness, and behavior change among the youths on issues related to sexual interaction, myths, and misconception surrounding HIV/AIDS, combating discrimination, and testing and treatment behaviors.

In 2004 and 2005, India was engulfed with an HIV/AIDS pandemic, with 5.13 million people living with HIV/AIDS then (UNAIDS, 2006). ZMQ launched 'Freedom HIV/AIDS' on December 1, 2005, the World AIDS Day, as a gift to Indian youths. ZMQ partnered with the state of Delhi, the Delhi State AIDS Control Society, and Reliance Infocomm – one of the largest mobile operators in India. Over the period, many more partners from all sectors joined the initiative to make it a success. Later, the initiative was scaled to different parts of Africa under the Africa Reach program of ZMQ. The success of the initiative led the company to start many more new mobile games initiatives to address critical health challenges in the developing world.

One of the strategies adopted was to create four games to catch different mindsets of people, games targeting youths, rural communities, and out-of-school children, using popular and accessible games, clear and well-designed messages, easy to maneuver user interfaces, and clear instructions.

On the first day of the campaign, mobile games on HIV/AIDS were made available to 29 million subscribers of Reliance. Later, more telecom operators were added. In a span of three years, the games reached 42 million subscribers with 10.3 million game sessions downloaded. This initiative was among the first and the largest mobile phone game program in the world to create behavior change.

In this chapter, we first outline the development of the games; second, link them to various impacts such as learning and behavior change; third, discuss some ways

we measured the impact of the games, and fourth, discuss various challenges of the projects – both internal and external.

Objectives

The objective of the program was to reach out to the youths to increase their knowledge about HIV and AIDS, with the broader goal of encouraging behavior changes, including:

- Promoting abstinence from sexual activity until marriage to increase the age of sexual debut.
- Promoting the importance of being faithful to reduce the number of partners.
- Increasing the correct and consistent use of Condoms.
- Improving knowledge of HIV and other STI transmissions.
- Reducing myths and misconceptions.
- Reducing the level of stigma and discrimination associated with people living with HIV/AIDS.
- Increasing the demand for information and services related to HIV and AIDS.

Why mobile?

Mobile is a device for almost everyone. It is an ideal tool for interventions targeting individuals, especially the youth. The reach of mobile phones in developing countries is more than any other technology or infrastructure. There has been a tremendous growth in the number of low-resource handsets in the world, and the growing penetration of telecom networks especially in the developing world. People who never had access to technologies such as fixed landline phones, computer, or the internet, now have mobile phones in their hands for communication and data transfer. According to the prime UN telecommunications agency, International Telecommunication Union, the number of mobile phone subscriptions worldwide has reached 4.6 billion and is expected to increase to five billion. India alone has over 750 million mobile phone subscribers (ITU, 2010). This explosion of mobile phone usage especially in developing countries has the potential to service delivery on a massive scale.

We believe that exploiting the ubiquity of mobile phones and taking information through mobile phones to communities at a massive level can improve their lives. This was done by turning critical information into an approachable language using mobile phone games and integrating them in the public health management system to connect with communities on issues related to HIV/AIDS and other communicable diseases.

Theory of change: mobile games as an effective tool for learning and behavior change

From card games to puppetry to video games, people have been playing games for centuries. A game is a challenge posed for users, which provides engagement to players with some target/objective to be achieved, based on some set of rules and frameworks. A player needs to perform different tasks which he/she would be unable to perform in the real world. Thus, the virtual activity of the game enables the player to engage in a risk-based activity of the real world in a virtual risk-free environment. This risk-free environment gives an opportunity to the player to try various risk options of the real world and see the consequence of each of them without any physical harm. This virtual environment also helps the user to learn new things, de-learn the previously learned things, and apply new things based on the cognitive learning, which leads to behavior change in the virtual world, thus retaining the changed behavior in the real world.

Our theory of change has been the use of mobile phone games to create awareness on HIV and AIDS, finally leading to behavior change. It has been proven that games can serve as an ideal platform to provide real-world environments and its risks on a compact (in terms of both resources and timeline), risk-free platform. The game enhances knowledge and learning in an engaging and entertainment mode, and this provides a basis for promoting behavior change. The complete model of learning for behavior change in the world of digital games is based on social cognitive theory (Baranowski, Buday, Thomson, and Baranowski, 2007).

The theory proposes that behavior change is a function of enhanced skills and confidence in doing the new behavior. Games engage users and add elements of enjoyment and excitement, thereby enhancing behavior change through enhanced motivation. The use of mobile phone games for health-related behavior change is still in the early stage of development, but incorporating theory-based change procedures provides reason to believe that they can be effective.

Models of behavior change communication in Freedom HIV/AIDS games

Freedom HIV/AIDS has taken inspirations from various behavior change theories such as social cognitive theory, AIDS risk reduction model, health belief model, and the stages of change. The approach adopted by ZMQ has been more of a blended approach, by taking some components from these theories and embedding them in the games. Drawing on an array of genres, content types, and learning activities outlined by Prensky (Prensky, 2001), our research team explored various

game formats such as participatory games, board games, and online games to understand and adopt various strategies in designing the games. Some of the genres which were taken as inspiration were role-play games, decision-making games, detective games, single shooter game, popular sports-based games, virtual game shows, and action mini-games.

ZMQ has also been studying the behavioral patterns of its previous games and at the same time regularly launching more and new genres of games to have a better understanding of behavioral patterns. One thing that has been observed common among all these games has been the interaction with various real-world scenarios in a risk-free gaming environment. This has been named as '*Real-World Risk Reduction Method using Game Mechanics*' – a ZMQ model.

Other key considerations

One of the key considerations to develop the gaming campaign was to have games available on low-end devices. It was important to develop games for black and white devices which had a very small cache memory, as 65 per cent of Reliance subscribers were based in semi-urban and rural areas with low-end devices. The challenge was to keep the game size to 32 kilobytes for black and white and 64 kilobytes for colored devices. Another key consideration was to have simple messages and user-friendly instructions. Lots of icon-based messages were also used to convey messages to less literate communities. One of the other main reasons to use cricket and quizzes was the same. People in India know how to play cricket, and trivia game shows (based on 'Who wants to be a Millionaire') have been popular TV shows/games in India for years. The game design in terms of maneuverability was kept simple, user-friendly, and easy. Also the instructional designing of the game was done in a scientific method. One of the other main considerations in designing the game was to keep intact cultural values. In the Indian context, giving HIV/AIDS information and talking about sex are considered taboo, so the messages were designed keeping the cultural sensitivities in mind.

The games

Safety cricket – a mass appeal game

One of the games planned to be used for Freedom HIV/AIDS was decided to be a sports-based genre. Cricket is the most popular sport in India. It is like a religion in this part of the world. The game is played and watched by almost everyone – the rich and poor, young and old, men and women. Safety Cricket has been a very popular and mass appeal game based on cricket.

Figure 11.1 Screenshot of Safety Cricket

Source: Freedom HIV/AIDS and ZMQ

As the majority of the people know the rules of the game, users playing a mobile game do not need any specific instructions to understand the game play. But then there was another reason, more of a scientific one than anything else, of choosing cricket as our prime game for the initiative. This is primarily the format of the game, which involves different game mechanisms; bowling – in different styles, batting – with different strokes, scoring different types of runs, getting out in different styles, fielding, and wicket keeping. It is also a turn-based game, where two teams play their innings in turns and eleven players of each team play one by one to make one innings. The playing style of one batsman can really influence the behavior of other batsmen, thus inducing a certain sense of precaution before taking a risk, which matches with the social learning theory of behavior change (Bandura, 1977).

The first component of learning in the game is an informational component, which gives knowledge to the players and increases awareness on HIV and related risk. The messages clearly demonstrated how a risky shot played by a batsman can bowl him out from the game and similarly in a real-life scenario too. The messages were simple but clear to impart learning, create awareness, and increase knowledge.

Another component in the game related to the social theory is to develop self-control and risk-reduction skills. The cricket game helped the player to know what their risks are and how they can change them. In the cricket game, risk balls in the game need to be tackled very carefully. The player needs to take adequate precaution while playing the ball and try to reduce risk in selecting shots and develop self-control. The player should also learn how to leave a ball which might look like a loose ball but actually is misleading and can be fatal. Similar situations are enacted in the real-life scenario, especially related to risky sex behaviors.

The third component in the game is to increase an individual's self-efficacy in implementing these behaviors. Self-efficacy helps in developing an individual's character by imbibing learning from observing things and experiencing various

different situations. This component helped users to enhance their skills like how to use condoms correctly, how to negotiate safer sex, and how to say no to unpleasant situations or unwilling circumstances. The cricket game play did it in the same manner. The game was designed as a single player game, but was used in two ways. In the first mode, the game was played by single users in an individual game play mode, and in the second mode, it was played as a single-player shared game in community settings in a group of four to ten people. The first mode was predominantly used by individuals downloading and playing the game. Here, a player would role-play as different batsmen and learn from the previous batsman's mistakes and improve in consecutive batting turns. Thus, the user learns by observing multiple batting styles and different risk-plays, thus gradually correcting in consecutive batting turns. The batsman trying to attempt a risky and fast (deadly) ball is likely to get out.

The community shared game-play mode was primarily used for training in the classrooms and group meetings. Here, the game was played in group settings of four to ten players who played a single game by turns and sharing the same device. The player batting first is observed by the next batter in the turn. The consecutive batsman observes the playing styles and risks in the game, and tries to improve on mistakes by imitating a safer-play. On every fall of wicket, the outgoing player will share his mode of getting out with his peers and discuss the messages he received during the game-play. The discussion helped the players to model perfect game-play style to win the game. The group mode also helped in improving an individual's performances.

Figure 11.2 Screenshot of Safety Cricket messages
Source: Freedom HIV/AIDS and ZMQ

Cricket was just a tool to pull the crowd to play the game but the messages played a crucial role in associating different cricketing instances with a real-life risks and situations related to HIV and AIDS. For instance, a message like '*No Helmet No Cricket; No Condom No Sex*' became popular slogan and jingle.

Below is the list of cricketing messages alongside the subsequent life-based (HIV/AIDS) messages used in the game.

Table 11.1 Messages used in the game

Cricketing Messages	HIV/AIDS Messages
Flirting with outgoing deliveries could get you out	Saying Yes to abstinence is saying Yes to oneself
Protect yourself by wearing a guard and a helmet	Use condoms for safe sex
Play with caution	Be faithful to one partner – prevent HIV/AIDS
Play carefully. Do not step out of crease	Abstinence protects you from HIV and STDs
Be careful, do not run your partner out	Love means faithful to one partner
Take your time. Do not rush	Irresponsible behavior can lead to HIV/AIDS
Saying No to risk means saying Yes to your team	Be faithful and make a happy family
Select a right delivery to avoid risks	Avoid unsafe and casual sex
Waiting to play a right shot puts you in control	Waiting to have sex puts in control of your life
Do not hurry, build a partnership	Enjoy a relationship without the complications of sex
Take your own time to score run	Do not fall to peer pressure
Play your innings well	Do not hurry for sex, abstinence is the best to avoid HIV/AIDS
Do not fall to sledging	Avoid unwanted sexual attention

AIDS Messenger – an adventure game

AIDS Messenger game is an adventure-based multilevel game. From a gamer's perspective, this is simple to play, easy to maneuver, highly engaging, and offers instant rewards. Moreover, the speed of the game-play increased with the increase in levels, which made the game even more exciting. The objective of the game is to deliver correct objects such as condoms, safe sex instructions, red ribbon, health tips, access to blood tests (HIV testing), counseling tips, and tips to reduce stigma to virtual communities in the game, based on their specific needs and risk assessments.

The behavior change induced in the game has taken inspiration from the AIDS Risk Reduction Model (ARRM) developed by Catania, Kegeles and Coates (1990). In the AIDS Messenger game, the player moves from one level to the next level in the game, as a result of delivery of correct information and safety objects demanded by the virtual communities and villagers. The gamers must pass through three stages – identifying demands of villagers (behavior labeling), selection of right objects for delivery (commitment to change), and making the right delivery at the right time (action).

Figure 11.3 Screenshot of The Messenger

Source: Freedom HIV/AIDS and ZMQ

In the game, the user is represented in the form of a dove – a symbol of peace or a messenger of HIV/AIDS awareness. In the gaming mode, the user goes around various virtual communities and identifies risk behaviors in every community. The people in various such communities are engaged in different types of risk behaviors such as IDUs engaged in use of drugs and alcohol, youths engaged in unsafe sexual activities, truck drivers having unsafe sex, female sex workers having sex with multiple partners, migrant workers engaged in unsafe sexual practices and being unfaithful to their wives, and men having sex with men engaged in unsafe sex and having multiple partners. These are all labeled as high risk members as they are involved in high risk activities, which can transmit HIV and AIDS. This is the stage where an individual's behavior in the community is recognized and is labeled as high risk behavior. Thus in the game, the risk assessment process immediately informs the communities about high risks in their life and the gamer tags these communities.

In the next level of the game, these tagged community members are immediately advised to check their activities, based on risk assessment in the first level of the game. This is simply done by providing them timely advisory services with powerful messages to influence and then change their actions and behavior by counseling

them, providing health tips, increasing their knowledge related to HIV/AIDS and STIs, and busting the myths on the use of condoms. Thus in this stage, players are counseled and are asked to make a commitment to reduce high-risk sexual activities and to increase low risk activities.

Finally, in the last level of the game, if community members in the game do not change their risk styles, they are approached with a focused virtual action to change their behaviors. The idea is to take action, which is provided in the game through the use of virtual avatars with messages, the users are provided with condoms, accelerated counseling services, disposable syringes, family pictures, and convincing them to go for HIV testing.

Life Choices – a role play based life-skills game for girls

Life Choices is a multisenario role-play game based on life skills, where the user examines various feelings, negotiates relationships, encounters risk situations, and finds ways to tackle them. The game *Life Choices* takes inspirations from the Health Belief Model (Janz and Becker, 1984), where players change their behaviors depending upon their knowledge, attitude, recognizing vulnerability, belief in outcomes of right choices, and by taking prompt action.

In the game, the user comes across various scenarios where he/she interacts with various real-world situations and the relationships within it is like with parents at home, relatives and cousins, peers in school, boyfriends/girlfriends, friends at a party, and people in public places such as transport (bus and metro) and mall

Figure 11.4 Screenshot of Life Choices
Source: Freedom HIV/AIDS and ZMQ

(carnival and shops). Each situation presents a dilemma and alternative course of action that a user has to choose from. On selecting an option, the user examines the possible consequences of each situation. In each situation, the user also has to examine various feelings and negotiate various relationships. The main character in the game is a girl, whose objective in life is to achieve her professional goals. In order to achieve this, she encounters different real-life challenging situations and examines her feelings, negotiates relationships with peers and friends, communicates with her parents and teachers, explores various feelings of attraction, establishes relationships with partners, and often restrains her feelings. For instance, in one of the situations, the mother of the girl persuades her to get married early. The situation depicts emotional pressure from the mother and the rest of the family. The girl examines all the consequences of getting married early and has choices to select for the next step. The objective of the scenario is to negotiate family pressure and find a correct step to move to the next situation. In this scenario, the correct step is to pursue her education further and acquire professional skills to lead a healthier, happier life.

The game provides different options and the user selects one of the options and sees its consequence. Any option chosen whose consequence is negative and arouse a warning will lead to change in attitude and ultimately change in related behavior.

Great Escape – a role play based detective game

Great Escape is a role-play based detective game and takes some inspiration from two models of behavior change; partly from the stages of change model (Prochaska, DiClemente and Norcross, 1992) and partly from the social learning theory.

In the game, the user is a detective who is trapped in different risk situations and needs to fix solutions in each situation and find an ultimate escape route to win the game. In this process, the detective (user) passes through various risk situations – one after another to ultimately make a successful escape. The stages of change model is embedded at the micro-level of the game play that is within each game level (risk scenario) and the components of social learning theory are woven at the macro-level (learning shared across different risk scenarios).

Each situation in the game is a micro-level scenario where the detective (user) first has to identify the scenario and the risk associated with it. He then has to find relevant tools to solve the problem in that situation. For instance – if the user is trapped in a network of intravenous drug users (IDUs), he first needs to identify the risk situation (pre-contemplation) and then he needs to identify danger sign (contemplation), that is sharing of syringes or use of re-use of syringes in this scenario. Finally, the user has to provide the right tools (action), for example searching disposable syringes and relevant counseling tips.

At the macro-level, moving from one situation to another, the user collects tools to identify each scenario, its problems, and solutions. For instance, in the IDU scenario, the user finds condoms or counseling booklets for the truckers which he does not use in the present scenario but carries it forward to be used in other appropriate risk scenarios. Thus the user is using his previous learning and applying it in the subsequent risk situations.

As the core mechanics of the game is of a detective game genre, the user also has to search, collect, and use escape tools such as keys, maps, mobile phones, a passport, credit card, password, and other items that help him in his ultimate escape. These escape tools are collected by answering questions correctly (HIV/AIDS quiz), presented in a quizzing format (as a trivia game) with four options based on the style of popular game show 'Who wants to be a Millionaire'.

Figure 11.5 Screenshot of The Great Escape

Source: Freedom HIV/AIDS and ZMQ

Evaluation

The games designed had different outcomes in general. The learning outcomes from the games designed have been immense. Safety Cricket game resulted in change in various risks behaviors based on learning from observation and dealing with the consequences. Some of the key outcomes were increased use of condoms (safer sex methods), increased debut age for having sex (abstinence), and reduction in number of partners (being faithful). The outcome of AIDS messenger game was based on the actions generated by identifying risk behavior and then delivering the right message. The game resulted in adopting safer sex practices, especially the

use of condoms by busting the general perception that the use of condom reduces the sexual enjoyment. There was also increasing interest to visit counseling and HIV testing centers.

Life Choices was popular with adolescent girls. It increased the negotiating and decision-making skills of the adolescent girls, and helped them take their own decisions without any peer pressure. The negative consequences in the game aroused a warning, leading to change in attitude and ultimately change in behaviors related to life and health. In the game The Great Escape, the user identifies a risk situation, recognizes the need to change the situation, tries to acquire the tools to change, and maintains the same behavior if similar situation occurs. The overall outcome of the games increased safer sex practices and enhanced decision-making capabilities.

Assessing learning

Study 1

The method adopted to see the impact of mobile games was by conducting live workshops and doing sample surveys. Four villages in the outskirts of Allahabad, Saharanpur, Patna, and Sholapur were selected. In every region, 200 to 300 children from local schools, settlements, and out-of-school children were invited for a two-day workshop. Initially, children were asked to answer questions related to HIV/AIDS. Their answers were assessed. Later children were given instructions to play mobile games on HIV/AIDS. Each group was divided into four sub-groups where they were made to play each game three times. Depending upon the game,

Table 11.2 Co-efficient of learning summary results

Games	Pre-Test	Post-Test			Co-efficient of Learning after Three Game Sessions
		First Attempt	Second Attempt	Third Attempt	
Safety Cricket	.40	.48	.57	.68	.28
Great Escape	.33	.39	.46	.55	.22
Life Choices	.28	.37	.38	.49	.21
AIDS Messenger	.23	.24	.31	.38	.08
Average learning in all the games	.31	.37	.43	.51	.13

every child spent four to eight minutes per game. The initial learning was captured through pre-test. After every game-play, the children were given a post-test. The post-test comprises of five questions. Thus every game was played thrice and three post-tests were captured. The results demonstrated an increase in learning on a scale of one, after each game play, which is referred as co-efficient of learning in our survey. The survey demonstrated that there was an evident increase in learning from a pre-test score of 0.31 to 0.56 after the third game-play.

Study 2

The launch of the games was primarily an open-ended approach. In the span of fifteen months, the games reached to over 42 million subscribers with a real-time download of 10.3 million game sessions. A game session is defined as when the person has downloaded the game, played it, and submitted the score back on the server. There was a need to evaluate the game impact in a targeted sample region. For this, we used Safety Cricket, as it was a very special game which attracted a lot of people due to its popularity. In this game, a specialized social engine was built with pre-test and post-test models. This engine was used in a district for four weeks, where 27,900 users registered through a mass media campaign and over 76,000 game sessions of Safety Cricket were downloaded and played. The game starts with a pre-test form on HIV/AIDS with five questions on HIV/AIDS related to basics, transmission, and prevention with focus on safer sex practices, peer pressure, and sharing of syringes. After attempting the pre-test, the user plays the game. Every event in the game like scoring runs, getting out, or leaving a ball had its own category of messaging. Thus the arithmetical calculation of number of runs scored, wickets lost, balls played, and balls missed reflects types and number of messages delivered. After playing the game five times, a post-test form was generated with a

Table 11.3 Co-efficient of learning for Safety Cricket

Category of Messages Delivered	Pre-test Results	Delivery of Messages based on Category	Post-test Results
Basics on HIV/AIDS	0.57	18%	0.88
Transmission	0.39	31%	0.66
Prevention	0.43	23%	0.78
Testing	0.21	15%	0.43
Stigma	0.15	13%	0.44
Average Score	0.35	----	0.64

new set of questions. On completion, all the data related to pre-test, game sessions (five sessions), and post-test was submitted. This data was then analyzed.

Out of the 27,900 users registered in the survey, only 8,213 users played the games completely – submitting pre-test, playing it five times, and submitting the post-test. The average co-efficient of learning increased from 0.35 to 0.64. The results in Table 11.3 are based on the users playing it five times and then submitting the post-test.

Qualitative analysis was done to assess behavior change. Random surveys and interviews were conducted in the communities and audiences where the games were played. The success of the program was measured in terms of the following indicators.

- Increase in safer sex practices (condom usage, abstinence, faithfulness, and value of a single partner).
- Increase in ability and skills to fight peer pressure.
- Increase in demand for disposable syringes at healthcare facilities.
- General reduction in myths and misconceptions in the youths on issues related to HIV/AIDS.
- Reduction in stigma and discrimination against people living with HIV/AIDS.

Piloting and scale up

The mass media campaign started with the launch of mobile games on December 1, 2005 – the World AIDS Day and was inaugurated by Sheila Dikshit, the chief minister of Delhi. The games were made available to 27 million mobile subscribers of Reliance Infocomm, a leading mobile operator. At that time, 65 per cent subscribers of Reliance were based in rural India. In a span of three years, the games were available on other mobile operators and reached almost 42 million mobile phones with a real-time download of 10.3 million game sessions played. Almost 63 per cent of the games were played in smaller towns and cities. Analysis of these downloads in smaller towns and cities has shown that the prime reason of greater download was due to them being media-dark regions, where people did not have access to other mediums such as newspapers and TV.

Many parallel campaigns were also done using school learning games on HIV/AIDS in local languages, including Hindi, Marathi, Telugu, Kannada, Tamil, and Bengali. These campaigns became part of knowledge centers of the government of India (education department) with an additional 1.2 million beneficiaries. The project got extensive coverage in the media. Reliance also promoted the games by not

only providing them free but also sending SMS messages to millions of customers on a weekly basis. The games were made available on the top category of Reliance R-World. This also enabled the successful dissemination of the games at a much larger scale. A lot of poster campaigns were done in schools, colleges, and also at mobile recharge centers. NGO workers were involved to promote the games while doing their own campaigns. The pre-test of the four games showed tremendous results. In span of fifteen months, over 10.3 million game sessions were played.

Freedom HIV/AIDS was replicated in East Africa. In December 2006, a new series of games on HIV/AIDS was launched in Kenya, Tanzania, and Uganda in local languages – Kiswahili and Shen – under ZMQ's Africa Reach Program. In two years' time, the games reached to over 6 million mobile handsets with a real-time download of 1.2 million game sessions played.

Figure 11.6 Poster campaign of freedom HIV/AIDS at mobile recharge kiosks in a semiurban location

Conclusion

Although India still has the largest number of people living with HIV in south and south-east Asia, the rate of new HIV infections has nevertheless fallen by 56 per cent (UNAIDS, 2011). ZMQ's games are not entirely responsible for this turnaround, but at scale, we are confident that our messaging was a positive contribution to the turning of the tides. More gaming exercises were done by ZMQ for other communicable diseases such as tuberculosis and malaria and other lifestyle diseases such as diabetes, chronic problems, and cancer. Overall, gaming is a successful approach to create effective learning outcomes and bring about behavior change, especially in the field of health.

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