

Workplace Safety Education:

The backbone for promoting safety awareness at workplace

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Guide
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Title Sheet

Workplace Safety Education:
The backbone for promoting safety awareness
at workplace

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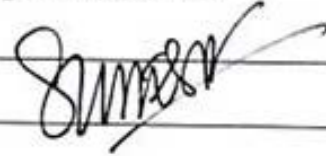
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Date : 9/7/14

Place : _____

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I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified

any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Contract supervisor's of Directorate of Construction, Services & Estate Management (DCSEM)

Shri Ramu Mishra, Shri Ashok Sahoo, Smt Ramabai, Sarju Rampal, and Rameh Kumar..

Abstract

Accidents are a major cause of death for people working in construction sites. It is an urgent need to address these issues for the betterment of safety workplace. Poor education, lack of proper training and knowledge about workplace safety issues are some of the main causes for construction accidents. This project aims to create safety awareness among workers using animation videos. These videos can be effectively used by the Safety Manager to provide an appetiser to safety through the engaging characters, amusing story line, and a humorous approach.

These videos are designed for less literates and are free of language and culture barriers, keeping in mind the wide and diverse audience. Visual

safety awareness material can be used, but due to low education levels of the workers it is difficult to communicate at diverse languages. Therefore wordless animated videos have the potential to make safety education more attractive and enjoyable can solve this problem. Issues like ladder safety, working at height, object falling from height, material handling, and their prevention have been communicated through this project. Safe workplaces are vital to the well-being of workers and the strength of economy of an industry or a nation. Thus, to promote safety education, I have decided to contribute as a designer, to improve safety on the job by preventing workplace injuries and illnesses of the worker.

Introduction



Every year there are thousands of deaths and serious injuries occurs at many workplaces. Accidents prove to be very expensive. Construction industries have poor safety record compared to the other industries[1]. Every organisation or a work site has a safety officer appointed for the safety implementation. But until and unless workers are not supportive to the safety program, it is difficult to maintain safety culture at any workplace. Personal protective equipment are provided to them but not used all the time. Workers should understand the importance of personal protective equipment(PPE) it has to ensure that worker remember safety guidelines and avoid dangerous practices

when nobody supervises them. Safety awareness is the key to controlling accidents. Good safety programs work from the bottom up.

The safety promotional activities has to be a continual year round program at the workplace, and the aim of safety promotion should be to induce employees to improve their own protective behaviour and to support to the management's stated goals.

A safety promotional objective includes increasing safety awareness at all the organisational levels and concerns about workers safety.

Needs and Problems



The present day problems:

After visiting and talking to the worker of the construction site at Anushaktinagar, it was realised that the workers face a few problems to understand safety rules at construction site. The difficulties could be listed as follows:

- Reading problem
- Communication problem
- Less education
- Unaware of safety rules

Due to these difficulties a “Need” was realised.

The need:

The need for an effective workplace safety education, which includes safety messages

communication and proper training for fewer educated workers.

In this report, I have tried to cover up few common safety issues at construction site, which can be solved easily with the simple common sense.

At the construction site many activities are happens at the same time and there are more chances for unsafe act and unsafe conditions. Workers needs to be educated to understand these safety issues.

Workplace safety education is the backbone for promoting safety awareness in the workplace.

Objectives

The objectives of this project was arrived at after a through data collection, online surveys, and actual interaction with the workers in Anushaktinagar.

Since the majority of the construction workers have a low education level, learning the workplace safety concepts with theoretical trainings are quite difficult for them. Therefore, animations that have the potential to make trainings more attractive and enjoyable, can overcome this problem and improve the safety performance in this industry.

The project attempts to the preparation of accident scenarios. The scenario will be grouped according to their severity as; fatal, severe injury,

minor injury accidents and near misses accidents. These groupings will be based on the data that will be obtained in the first stage from available literatures.

The main aim of this stage is to prepare effective scenarios that will be the references for the animations. In the scenarios, the definition of construction accidents, their frequency, place, severity, the cause of accidents and the possible precautions to prevent these accidents will be explained.



Methodology Contents:

Goal

Need

Background of project

History

- Existing safety awareness material
- Indian videos
- Importance of safety animation

Analysis

Concept generation

Exploration and ideation

Concept finalization

Why Animation?

Interviews

Story

Story board

Characters

Drawings

Story sequences

Report

Background of the Project

Finding a good topic for PIII was a serious task for me. Our IDC library was the best place to get an overview to get an idea on earlier projects done by our senior students. But I did not get any concrete subject according my interest.

One fine day I was coming from my residence to the IIT campus, I saw a construction site, with so many parallel activities were going on, workers were busy with work without proper safety protections, many were working on height without safety belt and so on. I was shocked! What would happen to their children if any serious injury happened to them while

working? And suddenly I started thinking on this topic, where as a communication design student, I could do something for the workers' safety issues. I know the importance of safety because I am already working in this field. I have designed safety posters for the safety awareness at the health and safety workplace. But people do not understand the safety posters displayed at the prominent locations due to their educational limitations or language problems.

Thus, I started thinking as to how I could communicate this easily to all the workers, with no language problems caused.

Concepts Generation

During this project I visited National Safety Council at CBD, Belapur, they supply safety awareness materials such as safety posters, leaflets, instructive book, safety pocket guide, banners and other promotional articles. 4th March is the National Safety Day; celebrated every year throughout the country. Industries and public sector companies procure these materials and distribute it among workers as a part of celebrations. I thought I should pick up any of the above promotional material and work on it. But after studying about the concept it was not suitable to me.

While designing safety posters I faced problem of communication due to diversity in languages, because workers are from different part of the states with different languages. It is not possible to put up all the

languages in a single poster. As a government mandate, says that English, Hindi and third regional language may be incorporated on public communication materials.

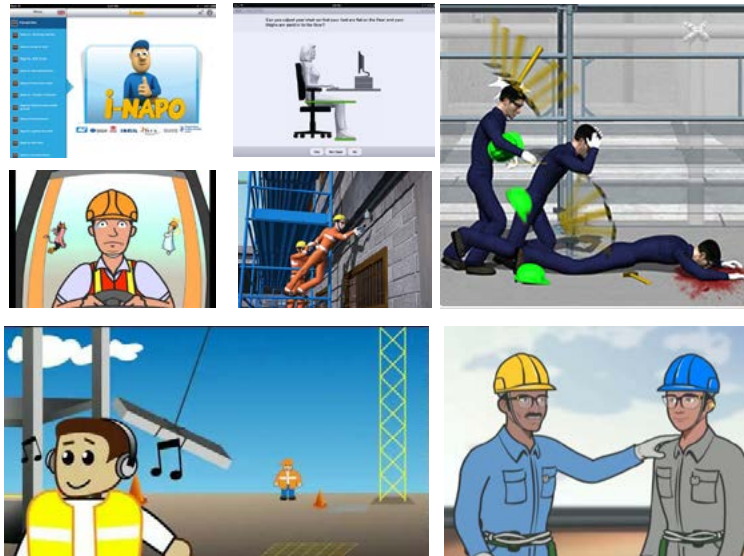
Poster looks more complex than easy to read when more languages added in it. Message should reach to everyone without any language barrier. I listed out few concepts such as safety manual, safety leaflets, safety instructive book, safety graphic novel, safety pocket guide, and safety radio messages but all are language based.

Then I thought, wordless animation is the best medium to communicate safety messages at all levels who has fewer educational level.

Why animation Video?

I have concluded that explaining through animated videos are more effective than posters or informative leaflets. Animation helps to recreate accident incidence to take safety measures. Safety animated videos are

- An innovative tool to teach and train,
- Audio with visuals,
- Localised concepts,
- No language barrier,
- Describe the effective use of equipment,
- Demonstrate preventative measures
- Clear, informative, memorable,
- In-house production.



With the help of animation, accident scenario can be generated again and explained to the workers for learning lessons from the incident which was already occur. The animated videos can be created according to specific requirement.

Related available videos

1. NSC (National safety Council)
2. CLI (Central Labour Institute)
3. LPA (Loss Prevention association)
4. OSHA (Occupational Safety and Health Administration)
5. Online workplace safety videos.

Existing videos drawback

- ☐ Different work culture...
- ☐ Language...
- ☐ Specific hazards...
- ☐ Different work environment...
- ☐ Unmatched...
- ☐ Not localised...

When I decided that animation is the best medium for making safety related educational videos, then I found there are many commercial agencies already having this type animation, but which are not really suitable for the specific requirement.

Motivation

Having graduated in applied art, I was interested in on hand illustration work. Work more than 15 years in Govt. sector, I was involved in workplace safety issues. But I also believe that animation is not only used for entertainment for children's cartoons channels, but also used an effective medium for communicating safety related communications messages. I feel being visual communication student, animation also can part of my profession and use of animation for the safety

related issues, will be add on knowledge to me as well as my department. I have been motivated by watching online animated videos. Bellow are the few images from animation videos adopted for workplace safety education. This is an opportunity to me that my design project is on animation based for the construction workers. This is a ideal solution for recreating accident scenarios for taking proper safety measures at hazards workplace.



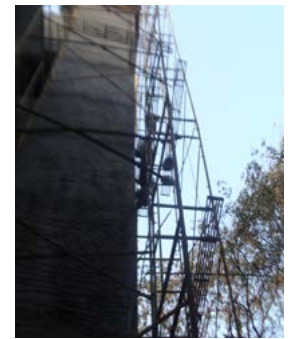
Ideation

Being a visual communication student, I have taken a tough task for myself by choosing from another discipline “Animation”. But I deliberately wanted to learn the art of animation. I worked in industrial safety environment and workers life is so closed to me and I feel, I am responsible for that. My PIII topic is based on workplace safety education. I have very much awareness about workers safety issues, and I am contributing through safety posters at my workplace. But I realised that safety messages communication will be

more effective by using digital animation. So I started finding a story for the video, but could not find well. Then I remembered, in my first year M.des, I did safety comic book for construction workers, I starting doodling similar on that direction, but in the way of animation. Instead of a typical filmy story, I found some major but common hazards incidences from the construction sites and started composing storyboard in that direction. Below are the some of comics illustrations on construction workers from my book.



Young workers



Causes of accidents

The causes may be human or mechanical failures. The two broad sources of the accidents may be classified in to:

Unsafe Act:

- Operating without authority
- By passing safe device/guard
- Operating at unsafe speed
- Using wrong tool
- Unsafe placing
- Taking unsafe position/posture
- Working on moving equipment
- Not using PPE
- Horse play at the workplace

Unsafe condition:

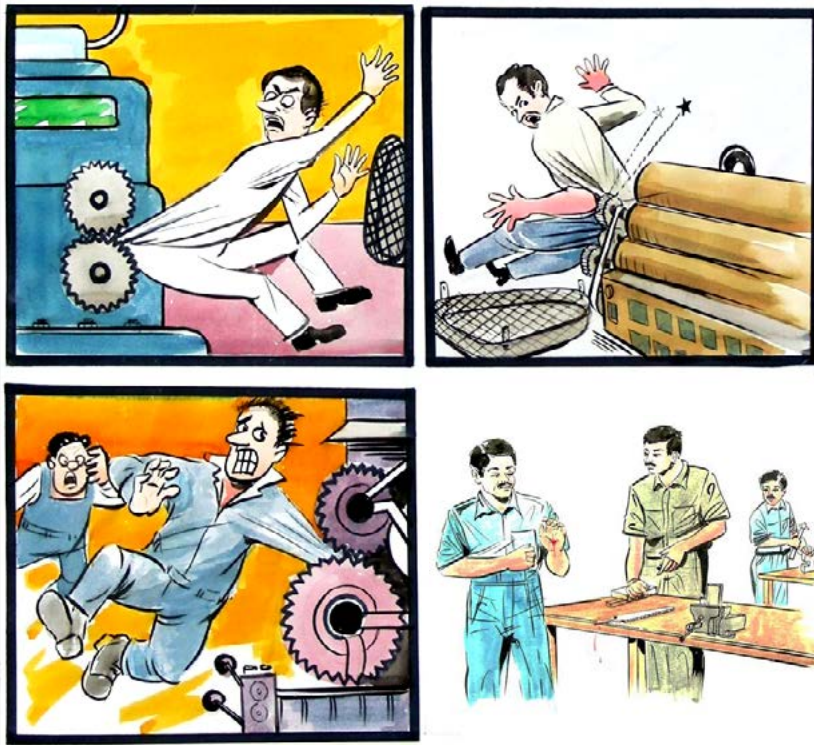
- Unguarded machine
- Defective equipment/tool
- Unsafe method of storing
- Incorrect illumination
- Inadequate ventilation
- Improper housekeeping
- Unsafe design/construction

Causes of Accidents

- Unsafe act 88%
- Unsafe condition 10%
- Non preventable 2%

Thus 98% accident are preventable, Accident don't just happen, but they are caused.

Similarly Construction industry also is not away from unsafe acts and unsafe conditions. Majorities of accident occurs due to carelessness and speed of the work. Due to completion of work within given time and day and night shift, ignorance of safety rules resulted majorities of accidents. Thus safety education and training is must to bring down human fatalities at work.



Interviews



Ramu Mishra, 46
From- Bilaspur, MP
Family-2 daughter, Old parent
Daily earnings-400/-
Work experience 15 years
Education- 4th std.



Rameh Kumar, 19
From- Gondia, MP
Family-Parent
Daily earnings-/-
Work experience- 1 year
Education- 6th std.



Ashok Sahoo, 42
From- Odisha
Family-Wife and two children
Daily earnings-450/-
Work experience- 15 years
Education- 9th std.



Sarju Kumar, 19
From- Sivani, MP
Family-Parent and sister
Daily earnings- 350/
Work experience- 2 years
Education- 5th std.



Ramabai, 40
From- UP
Daily earnings- 300/-
Work experience- 10 years
Education- 7th std.

Interviews

Construction work has a countless involvement of manpower. While interacting with Shri Ramu Mishra, one of the worker, he unfold many problems what he was facing. He was from Bilaspur, MP. In search of job he and his other co-worker were called to Mumbai for work. He is only 4th passed and knows only farming work. In his village farming is no more, then he migrated to Mumbai for work. Many like him have a same story. Less education has forced him entered in this job, for survival of his family, wife and two children. Thus, the construction industry absorbs many workers like Ramu Mishra, resulted untrained, no knowledge of safety rules, faces problems at the site and get injury or some time death. I was surprised while talking with Shri Ashok Sahoo, He was 9th passed, was working in cement factory, living

with parents. in one accident, lost his parents. Then he has to take of his entire family responsibilities. His cement factory also has been closed, now he is a contract worker.

People are involved due to their personal reasons, because of insufficient education, other jobs are not suitable to them and construction work needs physical strong condition than education level. While talking with another worker, I asked him about safety personal protective equipment like, safety belt needs while working at height, helmet, safety boot. He said we are not used to all this heavy stuff. We feels constrained, so don't used them.

I realised that they were not aware about importance of health safety and safety education not given to them.

Script

Writing a script is new to me to make animation short film on safety issues. I looked at the available videos. I thought I would get what I wanted as some initial ignition, which may start my project, but I was wrong, and spent almost half of the time of the project, and did not come out with some strong references. Then I visited construction sites in my areas, I found real first-hand experience while visiting these workplaces. I got engaged with the workers and interacted with them more freely. Some facts I came across while discussing with them. Due to lack of education they have to work like this, which requires a lot of physical strength. Nobody cared about understanding safety sign and safety educative materials. Because of illiteracy they don't read, and do not understand displayed information around the work sites. If someone

explained, they would follow, but all the time one cannot observe them, and due to lack of supervisions the workers face the accidents, sometimes serious and sometimes, even death.

After interacting with the workers, I thought that now, I could start scripting for the animation, but it was difficult for me that to construct a story based on the interaction with the worker. Then I realized that first I have to understand that why workers do mistakes on the job? Then I note down some facts which formed the base of my story.

I have focused on major act causing accidents at construction site, like working at height, proper use of personal protective equipment, ladder safety, housekeeping, material handling and objects fall from height.

Storyboard

This is the second task after finalizing the story, I have not written a story like printed in a textbook, but here I have observed the incident, which occurs at the workplaces, which was very common for everyone but no one took it seriously. I have illustrated these in my storyboard. It is a visual presentation giving glimpse of videos sequences through hand drawn illustrations of

the shot of each scene. And also I have created computer graphics in adobe Illustrator for straight to use in Adobe Flash for the animation. I worked in Illustrator, made rough sketches on papers and then redrew in Cintiq Wacom graphic tablet and composed in flash CS5 for the final animation. Below is the scene of a construction site.



Character Design

Animated video needs a character that conveys the message to the viewer, I have created a safety managers character that plays the main role at workplace to maintain safety culture and promote safety awareness among the

workers. I have also created some useful expressions which I need at time of actual incidence. Every expression is made according to the sequence of the incidents that occur during the construction work at full swing.



Character Design

There are lot of manpower is used at the workplace. I have illustrated some workers characters with different view point. and they are used at different locations. Not only human characters but other related environmental elements

also drawn with the help of Wacom Cintiq 13hd tablet. The entire experience was very enjoyable to me during this project. This is my first animated safety video, hope will be successful for educating safety workers.



Story sequence



This is a first sequence of the video, Safety Manager is going site visit, where work being carried out by the workers.

During his inspection he found that one worker was engaged in painting work, and standing on a ladder which was arranged with temporarily tied-up with loose rope, and the rope was getting loose, then shouted at the worker, and the worker could understand the matter he felt down.

The total scene is gesture based, I have not given any conversation between the Manager and Worker only gestures.

I want to make a series of videos that can communicate without language or any other narratives.

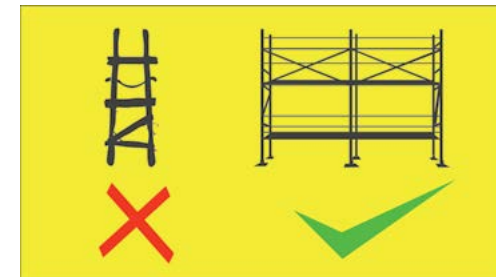
The message is clear, use proper equipment while working at height, makeshifts are dangerous, before using check it properly.

Story sequence



Resulted the scene with unsafe act and unsafe condition. Suggestive measures recommended by the safety manager, which has to implement after accident investigation.

End of the scene for safety measure I have shown proper working position with scaffolding ladder.



Story sequence



This is another incident at construction site. Hazards are everywhere, while the manager was observing all the work activities, he suddenly noticed that one worker was working at height without a safety belt.



The workers have to wear all personal protective equipment while working in dangerous situations, but this guy was not wearing his PPE, and suddenly got into an empty walkway which was not properly closed and fell down. The manager goes nearby him and shows other co-workers that were wearing safety belts while working.



The message, use personal protective equipment while working at height. I have shown proper working position with using PPE.

Story sequence



Safety has never rest time, A worker having their lunchtime they relax and remove their personal protective equipment for a while and forgot to put it again when going to their respective work areas.

In this incidence a worker is walking freely without helmet and safety boot, a crane is being operated, shifting material form one place to another, The manager is around and suddenly saw a worker walking under the load, he shouted at him but a worker did not heard and keep walking, suddenly a brick fall from the crane near to worker it was very narrow escape, this is near miss accident, one has to understand and should learn the lesson,

Learning and outcome

This was my personal interest to learn the art of animation, In my first year of M.Des program I could learn which I was knowing little bit earlier. But I took serious decision for doing my PIII in animation, I know it was difficult and should not take risk.

I was knowing if, I decide, I have do it only while learning in IDC, after passing out I may not get chance to learn or do it in latter stage.

Thanks to my guide Prof. Balan sir, who has given me encouragement to take up My PIII in animation, instead of making illustrative/ graphic novel.

My journey was very good at the and of project I feel proud that I know animation also. After going back to my sponsor institute, I have to contribute safety awareness program for benefit of employees and contract workers. Making safety animation videos will be my main agenda.

The outcome of this project will beneficial to my department, I feel this will be big outcome which I could learn during this Project.

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24. Safety Awareness programme, (chapter 25)

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