Train the Trainer

Harry's Hard Choices

Lowell Institute for Mineral Resources

Contents

Serious Games for Serious Safety

Video games have been established as potentially useful and highly effective learning tools. Video games include complexities in space and time that cannot be captured in other forms of training (Billet, Fenwick, & Somerville 06; Rose 03). Traditional training media can fall short where video games can capture the various norms, customs and relationships involved when a work crew faces a hazard. Serious games for mine safety training are contextually relevant, realistic and memorable. The entertainment value of videos games may greatly enhance learning by increasing players' motivation through the exciting prospect of improving their scores and outcomes (Gee '07; Gee '08). Good video games can even be addictive and contagious; 12 million people were subscribed to the game World of Warcraft in 2010 and over 20 million copies of the game Elder Scrolls: Skyrim have been sold. Video games for emergency rescue training can immerse the user in such challenges as workplace literacy, communication and crew interaction and decision making under duress.

For more than a decade, those in mine safety training and related fields have been calling for changes in the way new and experienced miners are trained. In a review of more than 30 years of research to improve safety and health training in the mining industry, Peters et al (2010) identified two focal points for future training research:

- Increasing trainee engagement by using more realistic or interactive methods
- Developing and refining methods to evaluate post-training competencies

More specifically, Peters et al. point to the research by Burke et al. (2006) and Robson et al. (2009) that suggests realistic and engaging training may result in greater transfer to the job. The researchers also identified the potential of "serious games" using virtual reality to create more realistic and engaging training, noting "the more experience people gain through participating in such role playing simulations, the better prepared they will be to handle real-world events." This view is strongly supported by the findings of Alexander et al. (2010) who also noted the need for realistic and engaging training methods and call for the development of "virtual reality theatres" (p. 41) for mine emergency rescue training. For four years, the UA team, with support from MSHA and NIOSH, have been focused on tackling the problems of mine emergency prevention and self-rescue. We have developed Dynamic Safety™, a new platform to create "serious games" in mine safety education.

Harry's Hard Choices came about from the feedback received while trying to make mine safety training effective and realistic, while occurring in a safe environment.

In the research conducted by the University of Arizona the following five core features in best practices of training were established:

1. Learning in a dynamic and suspenseful 3D environment
2. Reinforced learning through consequences and chains of cause-and-effect
3. Competitive gameplay, with scoring and outcomes based on choices made in an emergency scenario
4. Innovative training that reaches multi-generational learning
5. Promotion of leadership skills in cooperative, team-oriented situations

Game-based learning allows the student to work toward an objective, making decisions and experiencing the effects of those actions which allows users the freedom to make mistakes in a risk-free environment. It is through the learner's experimentation that they actively learn and are given the opportunity to practice what they are learning. This keeps engagement levels of the learner high.

Lastly, Game-based learning allows for the following to occur in your classroom:
- Standardized student assessment (individual and student-to-student)
- High engagement
- Student paced learning
- Instant feedback response to student mistakes
- Real world application in the learning process

The learner is always actively engaged!

Introduction to Harry's Hard Choices

The original NIOSH training exercise "Harry's Hard Choices: Mine Refuge Chamber Training" (CDC IC 9511, 2009) was designed to teach miners when and how to use a refuge chamber during a mine emergency. We expanded the exercise to focus on self-escape, emergency response, and general MSHA safety training for new miners and for annual refresher.

The game is immersive and can be played individually on a miner's own time at home, as part of a new miner or annual refresher course, as part of a quarterly evacuation drill, as part of a mine rescue team training, or as part of a pre-shift meeting.

We have used realistic simulations of various actions involved in MSHA training and in self-escape. The donning of the SCSR is captured from an MSHA training video. Our fire simulation is based on the spread of a real mine fire. Equipment in the mine is generalized from real equipment. HHC attempts to simulate fluid, team-based interactions and decision making. By role-playing as a section foreman (Harry), a player interacts with his or her section crew, which consists of eight other 'actors' which are controlled by computer-driven artificial intelligence (AI).

The game is very engrossing and difficult to master. Hence, miners want to keep playing and keep learning. Each time the game is played the events are randomized so it is never completely the same.

You can set up use of the game as a competition to see who is consistently your safest miner, safest crew, safest shift or safest mine.

With Harry's Hard Choices, safety is no longer a boring class to endure – it is a rich experience that enables discussion and engages your workforce.

The game is an excellent learning tool for miners for whom English is not their native language.

Let Harry Help You Train!

Utilizing a video game platform in safety training will create a learning environment and training opportunities that are rich, diverse, and engaging for both the trainer and the trainee. Harry's Hard Choices allows for a level of interactivity and problem-solving that builds upon traditional classroom learning. In addition, the game individualizes the experience each time it is played and used for mine safety training.

How to Start

This training manual was created in an effort to make video game-based training accessible for all trainers and students. Furthermore, instead of Harry's Hard Choice being an additional training on top of the other trainings that are already being taught at your site, HHC can support the existing health and safety subjects.

Harry's Hard Choices is aligned with existing health and safety topics that support training:

Topics in Newly Hired Experienced Miner, Annual Refresher, and New Miner Training	Game Mechanics and Story Elements in *Harry's Hard Choices*
Mandatory health and safety standards	Enforces OSHA regulations on irrespirable air: carbon dioxide, carbon monoxide exposure have direct impact on crew health; coal dust and smoke visibly effect crew fatigue; Fire hazards, flammable materials, and fire propagation; Errant ground control, such as unbolted top and collapsed pillars, compels users to survey and be aware of environment
Transportation controls	Selective use of powered haulage: SC24 type shuttle car and diesel-powered pickup truck with appropriate vehicle physics
Communication systems	Hard-wired mine phones at designated map locations and refuge chambers; encourages reporting of crew progress at regular intervals; user response to damaged/inoperative communication systems
Barricading/Escape and Emergency evacuation/firefighting plans	Serves as primary focus of simulation: Escape protocols following primary, secondary evacuation routes; lifelines with appropriate line markers and symbols; damaged/unusable lines; decision making process encouraging use of refuge chambers as shelters of last resort; use of fire extinguishers for small fires, e.g. such as engine fire breaking out
Roof/ ground control, ventilation	Ventilation patterns: realistic air flow with designated entry and return air paths supporting appropriate physics model; Fires spread along established ventilation paths according to airflow, encouraging users to consider fire propagation and rate of spread in their evacuation decision making; access doors and ventilators control fire spread and/or enable fire spread when damaged or left unclosed; Vent tubing to face. Roof/Ground control: dynamic roof falls; collapsed pillars may block evacuation routes

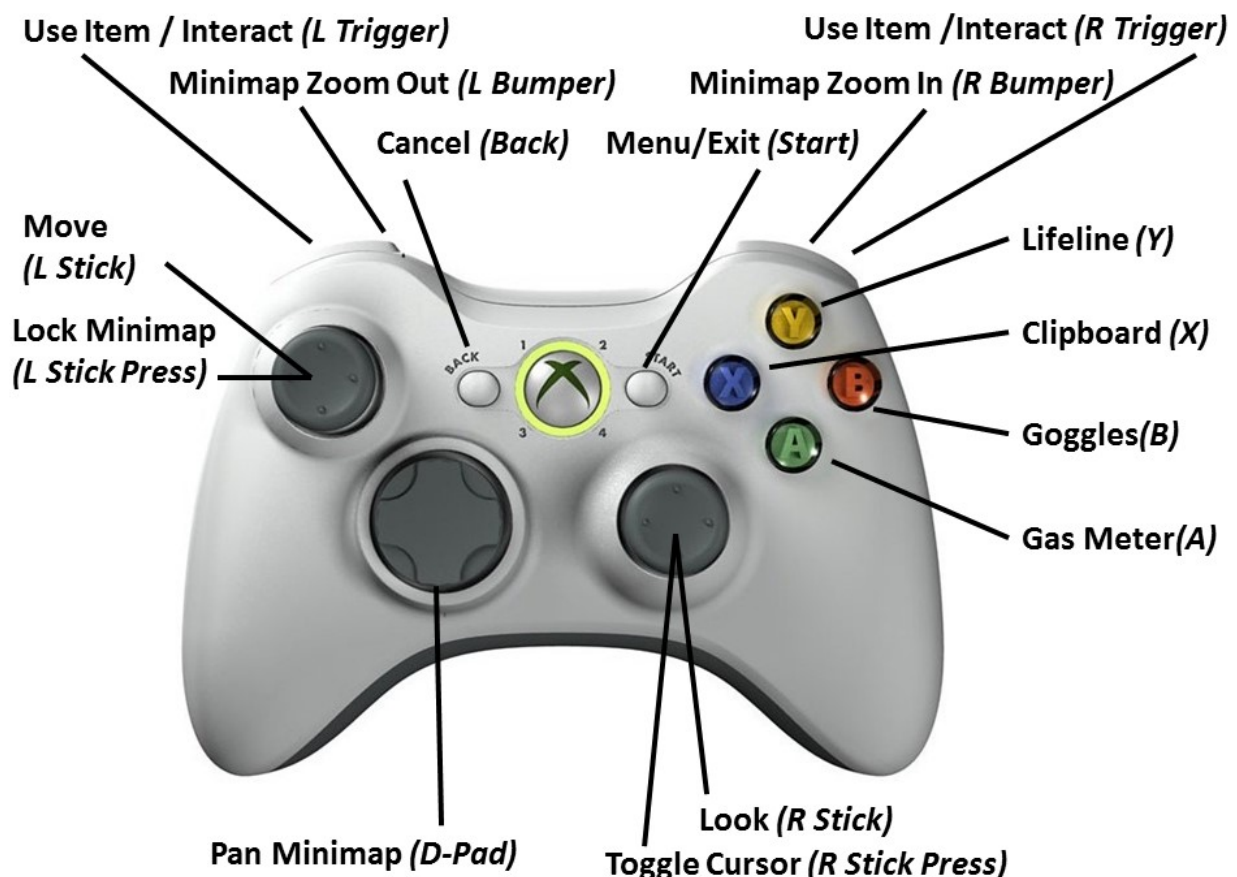|	
First aid	User must consider crew health and fatigue in evacuation strategy and adapt based on current events; Leg injuries: user may assist injured miners in evacuating or getting to shelter; First-aid assistance to miners suffering chest pains, leg injuries, and burns
Recognition and avoidance of electrical hazards and other hazards	Section power centers andelectrical cabling; shorts, downed lines, and other electrocution hazards; battery connections within powered haulage as spark/fire hazards
Prevention of accidents	"Know your ground": roof falls may lead to serious team injuries; various hazards-based real-time risk analysis and decision points: longer evacuation routes and uneven ground increase the risks of leg injuries and increase fatigue; venturing near fires subjects crew to potentially severe burns; gas pockets may lead to explosions; use of vehicles in limited visibility conditions; response to broken escapeway lines
Self-rescue and respiratory devices	Self-rescuers: M-20 SCSR and SRLD, with full donning procedures; game encourages management of usable breathing time and utilization of spares; defective breathing units, cross-checking, and crew response; MineARC refuge chamber
Mine gases	Encourages proficient use of gas meters - oxygen, carbon monoxide, methane levels impact outcomes; possible malfunction of gas sampling equipment; explosions possible
Emergency medical procedures; escapes and emergency evacuation plans; fire warning signals and firefighting procedures	Primary and secondary escapeways with game metrics to encourage adherence to proper protocols; safety tethers and lifelines; response to broken lines and/or blocked escapeways; carbon monoxide alarms, gas meters, and visible smoke as fire indicators; fire extinguishers placed at strategic locations indicated on map; use of goggles and effects of smoke on visibility; crew may become lost or separated in dense smoke; use of fire extinguishers
Health and safety aspects of the tasks to be assigned	Crew health, fatigue, pre-existing conditions factor into outcomes, influence crew morale; risk-analysis required by user to balance fast evacuation versus current environmental hazards
Introduction to the work environment	Four minute prologue introduces the environment and sets up conditions for mine emergency; Future: a pre-game tutorial introducing the workplace, crew, interface mechanics, and game rules
Authority and responsibilities of supervisors and miners' representatives	Communication with designated Responsible Person and emergency response team as part of end-game denouement establishing outcomes
Other topics as needed	Leadership skills: management of crew morale, objectivism, conflicts; second language communication; map reading and workplace navigation; Workplace literacy aids and learning point provide assistance via a virtual clipboard

HHC User Controls & Navigation

Besides the dynamic and active interface the learner will experience with playing Harry's Hard Choices, the game controller and the map will be two important tools needed to successful navigate the unfolding mine disaster. The student may feel confident in their ability to assist the underground crew to safety in the game, but if they experience confusion with the game controller or the map, the game will lose its purpose in training.

The students will need pre-game time to become familiar with the game controller and its functions. This can be done by having the hand-out that diagrams the controller at each game station. As a trainer, you can also take a brief amount of time to give an overview of the controller with the entire class. Similarly, this should be done with the mine map as well. Keeping a copy of both the map and the diagram of the game controller accessible to each student will improve the learning process of playing Harry's Hard Choices.

The Xbox Gamepad

The gamepad has all of the controls you need EXCEPT for the SCSR donning and swapping button. To don or swap the Breathing apparatus, use the 'B' button on the keyboard. The donning button was intentionally left off of the gamepad so that you wouldn't accidentally press it – since it's important to choose when and where you don (or swap) SCSRs very carefully.

Note: Once you tell the crew to do something, you can't "un-tell" them.

Use Item / Interact (L Trigger)
Minimap Zoom Out (L Bumper)
Cancel (Back)   Menu/Exit (Start)
Use Item /Interact (R Trigger)
Minimap Zoom In (R Bumper)

Move (L Stick)
Lock Minimap (L Stick Press)

Lifeline (Y)
Clipboard (X)
Goggles(B)
Gas Meter(A)

Pan Minimap (D-Pad)
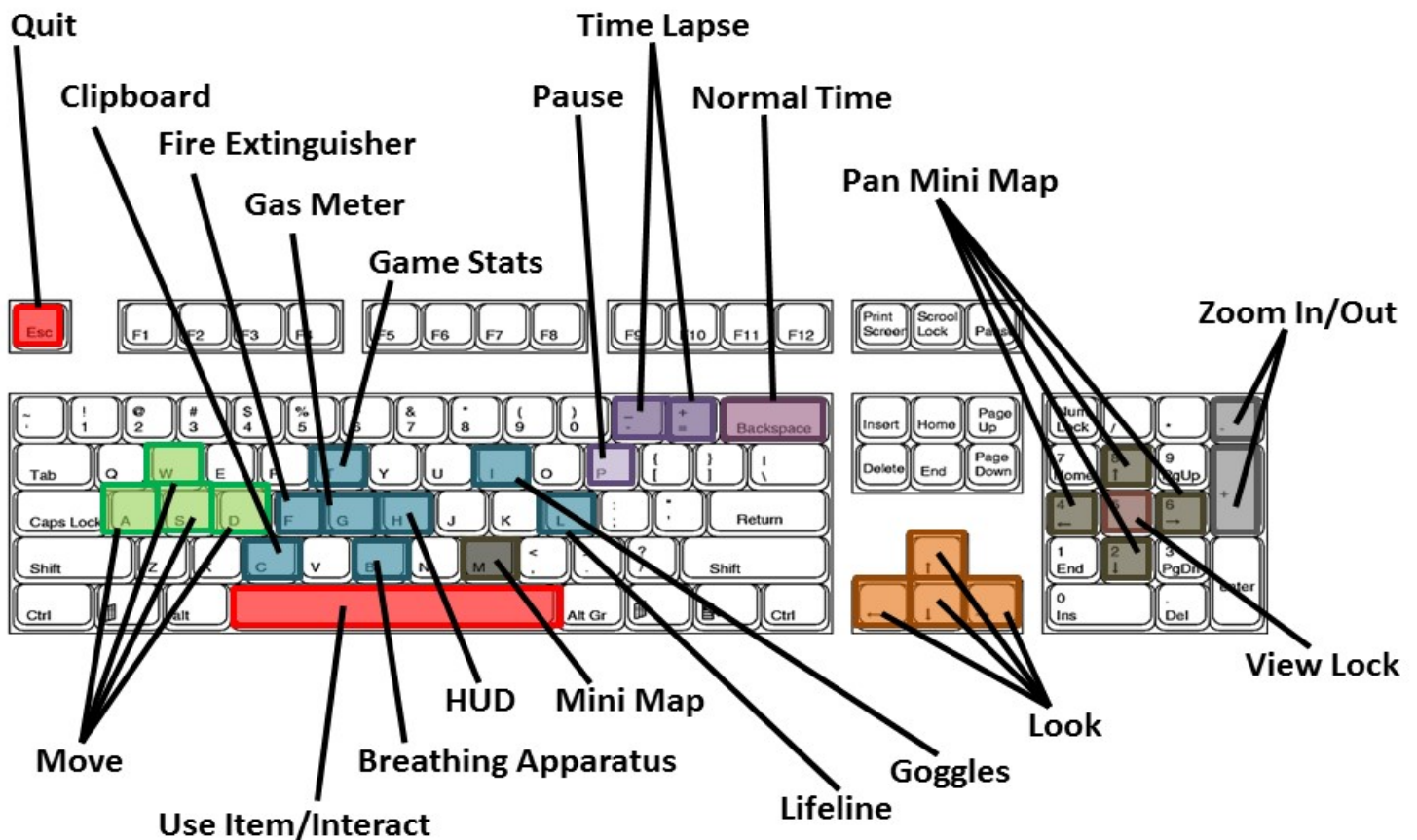Look (R Stick)
Toggle Cursor (R Stick Press)

The Key Board

This is a cheat sheet for keyboard controls. You do not need to memorize these controls. Except for the breathing apparatus, all of the important controls are on the gamepad.
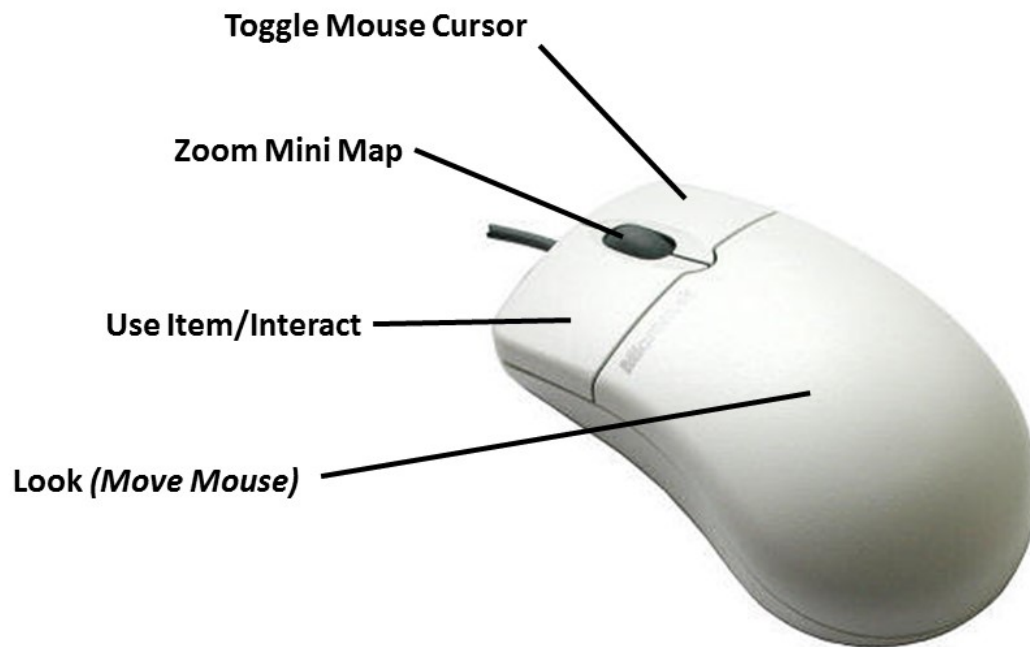
You can also elapse time by pressing the + and – keys. So if you're in a place where you're walking along and nothing much is going on, you can elapse time. Be careful in using these controls as sometimes it can cause you to miss subtle but critical events. Additionally, the escape key can be used to skip out of a conversation.

Note: If you need to pause the game, you can press the 'P' keys.

Quit

Clipboard

Fire Extinguisher

Gas Meter

Game Stats

Time Lapse

Pause   Normal Time

Pan Mini Map

Zoom In/Out

View Lock

Move

Use Item/Interact

HUD   Mini Map

Breathing Apparatus

Lifeline

Goggles

Look

The Mouse

The mouse can also be used to change head pose.The right mouse button is used to toggle a "mouse mode" that allows you to click on the Action Bar buttons and manipulate other **Heads Up Display or HUD** elements.

Toggle Mouse Cursor

Zoom Mini Map

Use Item/Interact

Look *(Move Mouse)*
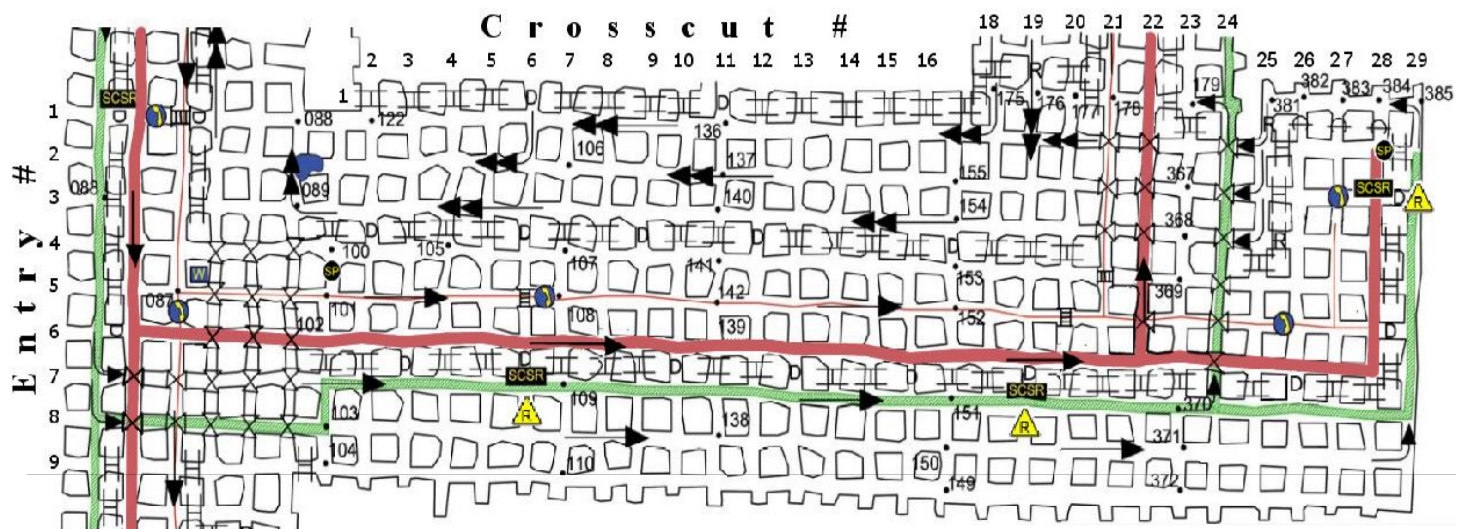
1st Escapeway	R	Regulator	
2nd Escapeway	B	Belt Tailpiece	
Track	Mine Phone	
Intake Air	SCSR	SCSR Cache	
Return Air	SP	Section Power Center	
Intake Air	SCSR	SCSR Cache	
Return Air	SP	Section Power Center	
Check Curtain	W	Water Shutoff Valve	
Overcast	·039	Survey Station	
Perm Stopping		Conveyor Belt	
D	Mandoor	R	Rescue Chamber

The picture below demonstrates your view during the game. This is the viewpoint of your character, Harry. You should be very mindful of your environment -- know your ground. During a mine emergency, bad things can happen if you aren't very careful.

Simulation Time

Game Score

Mini Map

Fatigue Level

Action Bar

Event Log

The Mini-Map

Shows you location in the mine. This blue-green dot is you, and the arrow shows the direction that you are looking in the 3D world.

Simulation Time

It starts at current time. This is NOT a stopwatch. It's up to you note what time it is for things like breathing apparatus. Just like the real world, breathing apparatus in the game will expire. You'll need to track your time to prevent this from happening.

Game Score

Anytime you make decisions in the game, it will impact your game score. You get points for making good decisions. You lose points for making bad decisions. The 'right' choice will depend on circumstances.

Event Log

It shows you what's currently happening in the game. It will tell you when you gain or lose points, when conversations are going on, or if the game is waiting for you to do something to continue.

Action Bar

It's basically your equipment interface. The white circle means a piece of equipment is active. The equipment in the game is safety-oriented. There's a few icons that you should pay close attention to: gas meter, goggles, lifeline, and SCSR. You may click these buttons using keyboard keys or buttons on the gamepad.

Note: there is also a mouse cursor mode available by clicking the right mouse.

Gas Meter

Use the gas meter on the bottom right of your HUD to check for dangerous gas levels.

SafetyTether for the Escapeway Line

Use it to tether to the line to keep people from getting lost. Crew can become disoriented and get lost in dense smoke, so I highly recommend that you use the tether whenever possible. It only lights up when you are in reach of an escapeway line.

Goggles

Click this to put on your goggles, which will keep some of the smoke out of your eyes and help improve visibility.

Donning or Swap SCSRs

This number indicates the quantity of SCSRS that each person is carrying. You can click on this button to don SCSRs. The rest of the crew will follow your lead, so when you don your SCSR, so will the rest of the crew. Since you're the leader, crew will always does do as you do.

Note: When beginning the game. You'll be equipped with your breathing, a portable M-20 SCSR on your belt, (quantity 1). This is a small, 10 minute unit, which is only long enough to get to a nearby safety cache. If you need a long-duration unit (SRLD), you'll need to get to a cache and pick them up. The SRLD is a 60 minute unit.

Also, if you pick up an SRLD before donning your 10 minute SCSR, you'll see your inventory go from 1 to 2. When you tell the crew to don their SCSRs, they'll automatically use the longest duration unit that they're carrying. So they won't don the SCSR if they're carrying an SRLD – they'll put on the SRLD first and save the SCSR as a last resort. They won't don the little one while lugging the big one around.

If you click the SCSR button again, you'll swap to a new unit, or toss the one that you're currently wearing if no spare is available.

Fatigue Bar

Fatigue is like health. As you (Harry) become more fatigued, the bar goes down, turning yellow, then orange, then red. If it drops to 0, then Harry loses consciousness. He's effectively dead – game over. Make sure this doesn't happen!

The Player's Direction & Position

Again, this is the mini map. It can be enlarged with the mouse cursor by dragging the bottom right corner. There are also keyboard and gamepad controls to pan the map left and right, and to zoom in or out on a position. This button on the lower left side of the action bar controls visibility of the map. This blue-green dot is your position in the mine, and this arrow shows the direction you are looking.

Note: Be careful. In some circumstances, you can become disoriented and even lose your map.

Your position
& direction
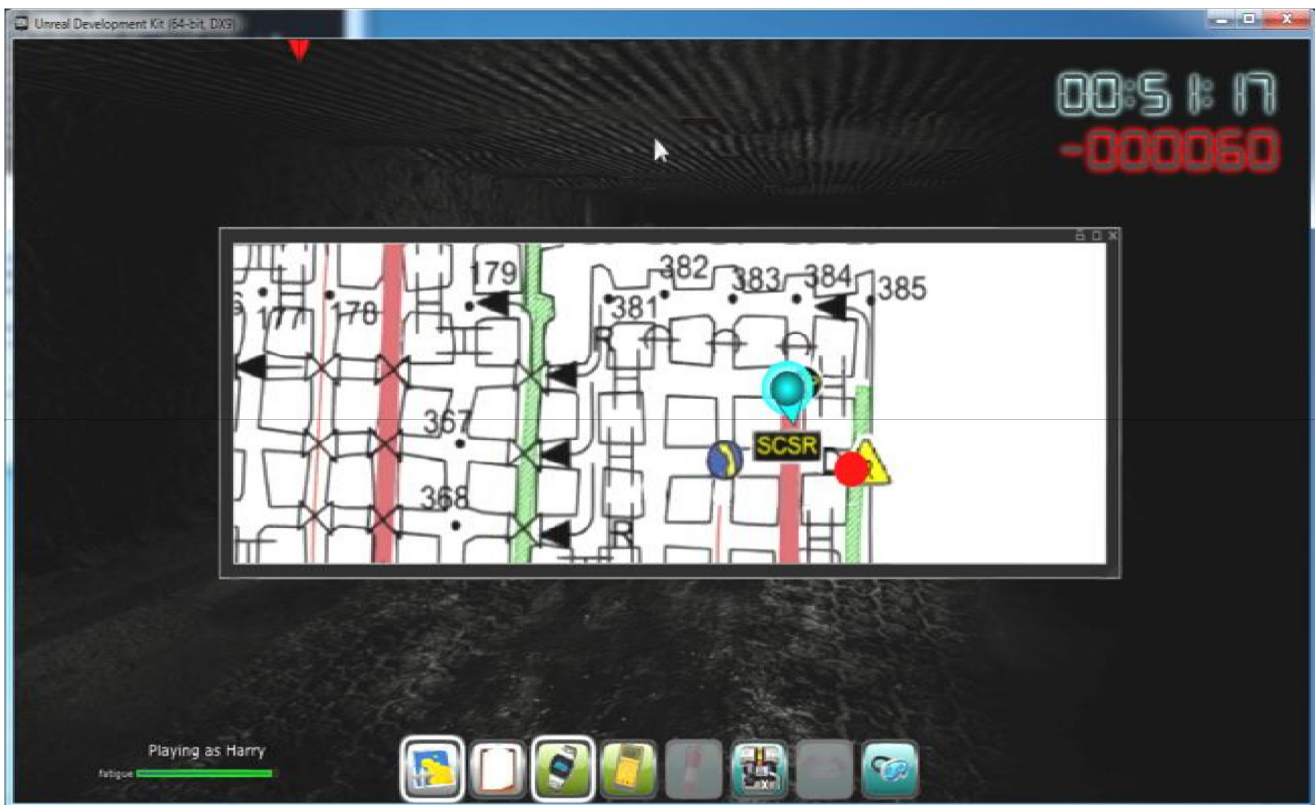
Mini Map

When you play the game, you're always working toward an objective. Objectives are attached to locations in the mine, which we call waypoints.

Waypoint Compass

Waypoint

Map Symbol

For example, if I am trying to evacuate the section, I'll get a waypoint at the exit of the section. Or, I make a choice 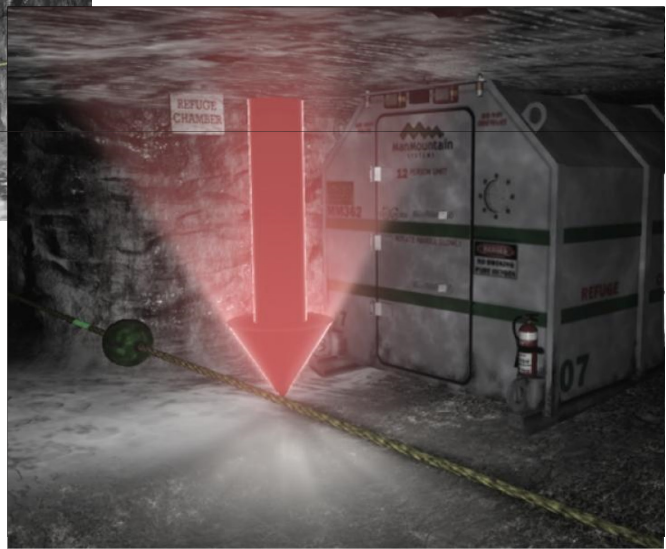to go to an alternative refuge, a waypoint will appear at a nearby Refuge Chamber. The waypoint is the place I'm trying to get there based on the choices I've made. The waypoint looks like a red bouncing arrow. The waypoint is also represented on your mini map. On the mini-map, it looks like a red dot.

Finally, there's a "compass" direction on the top of the screen that moves back and forth across the top.

The compass arrow shows my relative orientation to the waypoint. So if the compass arrow is in the center of my screen, it means I'm looking directly toward the way point, "as the crow flies." If I could walk through the walls in a straight line, I would eventually hit the waypoint. In reality, you'll have to navigate the mine using proper protocols to get there.

Note:*Each waypoint is presented by a 3D arrow, a 2D dot on the map, and a compass direction.*

The Character Interaction

There are several ways that you can make choices in the game. One is to agree with characters on your crew. The characters will have a discussion and present you with options. By agreeing with someone, you make a choice.

Interact with Characters

For example, Carlos wants to go to the Refuge Chamber. If I click on him, that means I've told the team that we are now going to the Refuge Chamber.

There will be carats (<>) on each character that presents you with a choice. You can only agree with them when the text is visible. If I want to agree with him, I'd turn my head to the right, until the text was visible. Then I can click him to invoke the choice. I can use the gamepad left trigger button (or left mouse click) to choose him.

Notice that sometimes you can have guys off-screen that present you with options. If there's a guy off-screen that has an opinion, you'll see an arrow (< or >) at the side of the screen indicating your off-screen options. For example, here I have a guy off-screen that is giving me a choice.

Each character has some "stat" bars above their heads. One is Fatigue, which works exactly like yours. When the character is fully fatigued, the bar goes to 0, and the character is incapacitated – dead. There's also another stat called "morale." Morale is based on the decisions that you make. When you make good decisions, character morale goes up.

When you make bad decisions – or don't make any decisions at all – the morale goes down. Morale is contagious. For example, if you make a decision that gets somebody killed, then crew morale will go way down. If morale gets low enough, a character may stop listening to you and even abandon the group. He may even tell you were to go, quite colorfully.

It's your job as the crew leader to keep these guys together and on task, and to get them out of this emergency.

Another way you can make choices in the game is to interact with the environment. You'll see carats (<>) on equipment that is actionable. If you walk up to it, you'll see text indicating what action you can take. Again, the text has to be visible for you to interact with it.

For example, if I want to get SRLDs out of this cache, I walk up to it and see this text. If I click my left trigger button I'll get a set of SRLDs from the cache. Everyone on my crew gets one spare SRLD, which will be updated in the inventory here on the task bar.

You can interact with anything in the environment which has carats (<>) on it. This includes some vehicles and haulage.
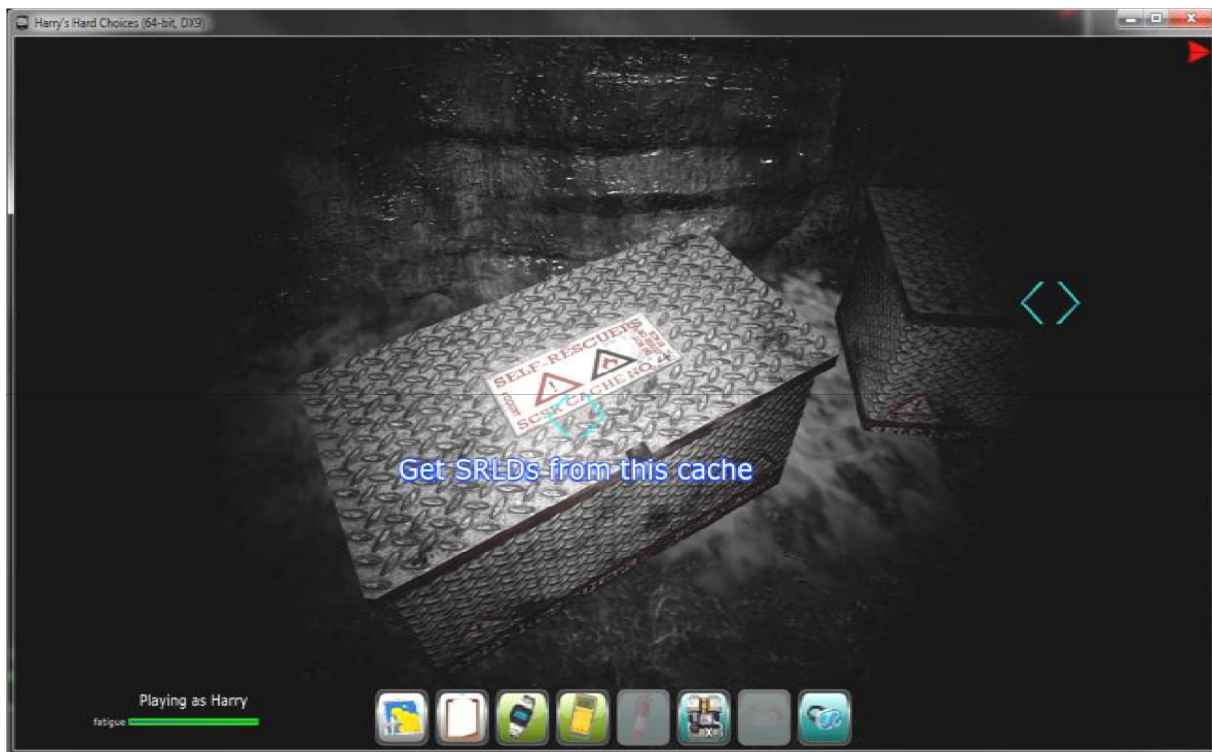
Interact with Equipment

The Experience

Harry's Hard Choices is flexible in user application. You can set up your groups into the following to play the game:

- Individuals
- Pairs
- Small Groups

Scenario: Create a competition between teams. Who can score the best while getting all of your crew out of the mine safely?

Your job as the facilitator is to circulate and answer questions, guide them through the learning. Prompt further questioning as to how they should approach the task. During the student's time with the game, being the "guide on the side" would best support the learning environment. This will also be an excellent time to informally evaluate how well the students are adapting to their game-playing role and if the training is serving to be useful at this time. Make note of any adjustments that can be made to ensure the success of the student. Remember their decisions are being recorded, not yours.

Goals, Expectations, and Scenario

Harry's Hard Choices is an interactive role playingsimulation game that uses a mining disaster scenario to train miners how to apply the best decision making required to escape an underground coal mine disaster. The players will experience realistic qualities of a real emergency: chaos, distractions, and unfolded events that are out of the control of the player. In the game, the player will assume the identity of Harry, the mine foreman. Harry and his 8 man crew must evacuate an underground coal mine in the face of a fire. The fire will set the stage for the player, Harry, to make choices. However, Harry's choices are compounded by a broad range of other scenarios that play out within the larger scenario of the fire. For example, possible randomized events include, roof falls, expiring or defective respirators, inoperative refuge chambers, flammable gases, broken escape lines, and numerous crew injuries. This makes the game complex and challenging but realistic. The player will have a different experience each time the engage the game based on what they have Harry do in any given situation. Although it appears evident that the goal and expectation is to get Harry and his crew out safely, the on-going lessons learned throughout the interactive game will prove to be just a valuable as the rescue itself.

Learning Environment

Training involves more than a room, an instructor, and students. Student engagement varies on the comfort and confidence of the learner. The best planned trainings can fail to reach the depth lesson plan outlined if the trainer has failed to create a positive safe learning environment. To create an optimal experience for the user:

- Demonstrating clarity with clearly stated learning objectives
- Creating a learning environment in which student's taking a risk and challenging themselves is rewarded

- Engaging and challenging learning experiences that foster critical questioning and predicting
- Establishing effective learning that allows the learner to apply the newly acquired knowledge to real-world application through self-assessment

It is important to create an appropriate learning environment in order to be successful on the Harry's Hard Choices is a gaming platform.

- Ensure minimal sound distractions
- Plenty of space for all the gaming systems
- Lighting is optimal for game play
- Instructor availability for questioning/feedback

Most importantly provide a safe and positive environment for learners.

Today's successful trainers understand the concept of learning as a "process rather than an event" and can identify opportunities and activities to promote transfer before, during, and after a training event. With the knowledge that the mining population is evolving in age, ethnicity, and social climate of the miners, adaptations to training are needed as mine training evolves too. Add the diversity of the mining population with current research on adult learning, it is crucial to make the training engaging and relevant. This will ensure transfer learning in the classroom and the workplace.

How to Use

This section sets aside the discussion of training and focuses on the nuts-and-bolts subject of how to use, launch, and troubleshoot Harry's Hard Choices.

Note that a USB Xbox game controller is not an absolute requirement (since gameplay can be accomplished using the keyboard and mouse or touchpad), however, it is highly preferred. Personal preference of whether to use the game controller or the keyboard or both together will be up to the individual user and their comfortability level.

Minimum Computer Hardware Specifications

Harry's Hard Choices can be used in one of two distinct graphics modes. The preferred mode is the HighGraphics mode, which requires a computer with a GPU. The alternate (and less preferred mode) is the Low Graphics mode (experimental). The Low Graphics mode can run on computers without a GPU, but expect a corresponding reduction in frame rate (slowed graphics and blurred delayed actions in the game). The minimum required specifications for each mode are listed below.

Minimum Requirements for High Graphics Mode

Below are basic guidelines for selecting or configuring a computer for use with Harry's Hard Choices.

| Parameter	Minimum Requirement
Operating System	Windows 7, Windows 8, Windows 8.1
CPU	Intel I5 or equivalent
GPU	nVidia GeForce 650/650m, AMD HD 7790
RAM	8 Gig
Free HD space	6 Gig

Minimum Requirements for Low Graphics Mode

The following guidelines represent the absolute minimum needed to run Harry's Hard Choices in Low Graphics Mode. Please note that the game will run at a reduced frame rate using these specifications. DO NOT use these guidelines when purchasing a computer specifically for Harry's Hard Choices: for new equipment refer to the requirements above under "Minimum Requirements for High Graphics Mode".

Parameter	Minimum Requirement
Operating System	Windows 7, Windows 8, Windows 8.1
CPU	Intel I7 or equivalent with HD4000 integrated graphics or equivalent
GPU	none
RAM	8 Gig
Free HD space	6 Gig

Running Harry's Hard Choices

After installation of Harry's Hard Choices either by inserting the disc or downloading the game, you will be asked a set of questions. Follow the game start-up directions. You can always change your preferences each time you re-start the game. For example, graphics mode can be selected at start-up. If you do not have a GPU or as you play, your frame rate is slow (game images are jerky and slow) then choosing low graphics mode at game start-up would be best. Must hit play or the 'Player Name' will reset. Unique identifier email address.

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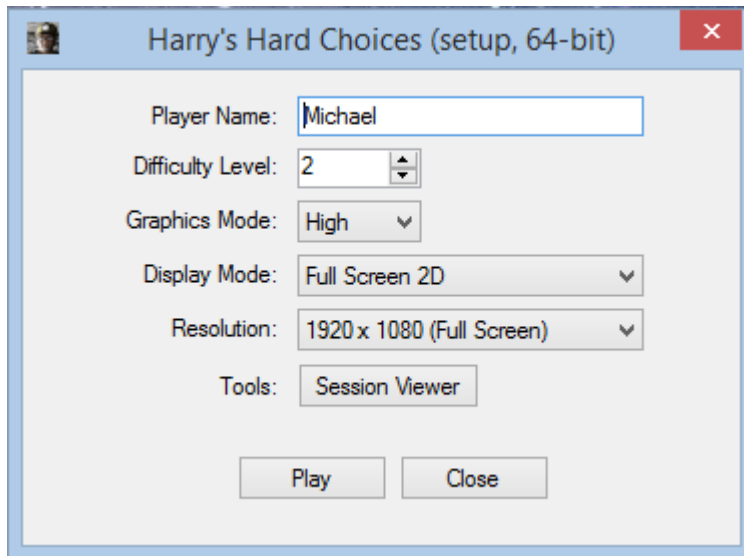
Windowed Mode

You can operate Harry's Hard Choices in the windowed mode, in which case the game will be displayed in a window, rather than full screen. This option is useful for computers without a GPU, where you might want to specify a lower resolution, but not have a loss of detail due to upscaling to full screen. This can be selected at game start up.

Settings are as follows:

Player Name: The user can enter their name here, which will be attached to the session files as a means for identifying who played that particular session.

Difficulty Level: Set this to the desired difficulty level. The default is 2, valid values are 0 through 4. The difficulty increases as the entered value increases.
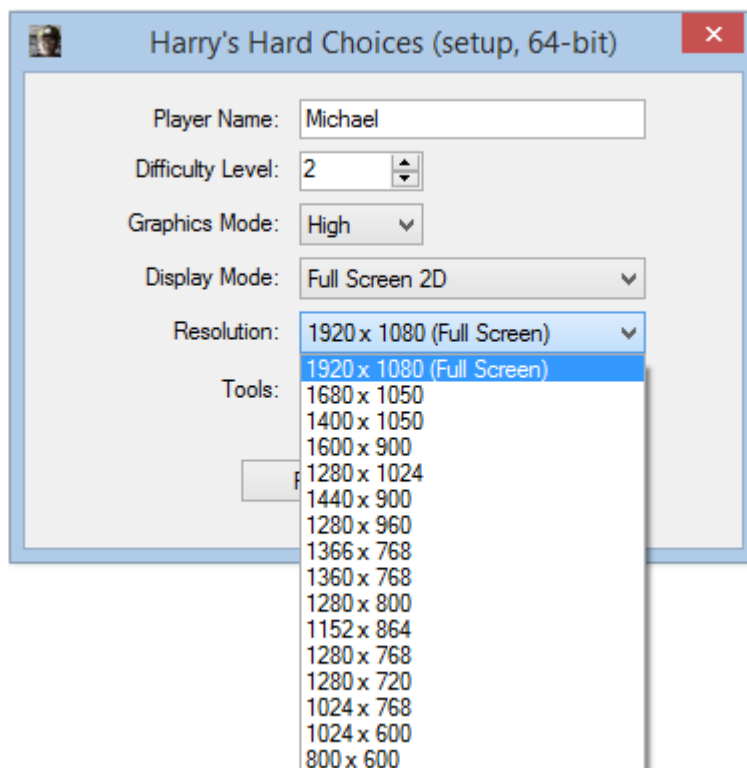
Graphics Mode: Set this to the desired graphics level.

The default (and preferred) setting is high. Use low if your computer does not have a GPU, or if you experience an excessively low frame rate.

Display Mode: Select the desired display mode:
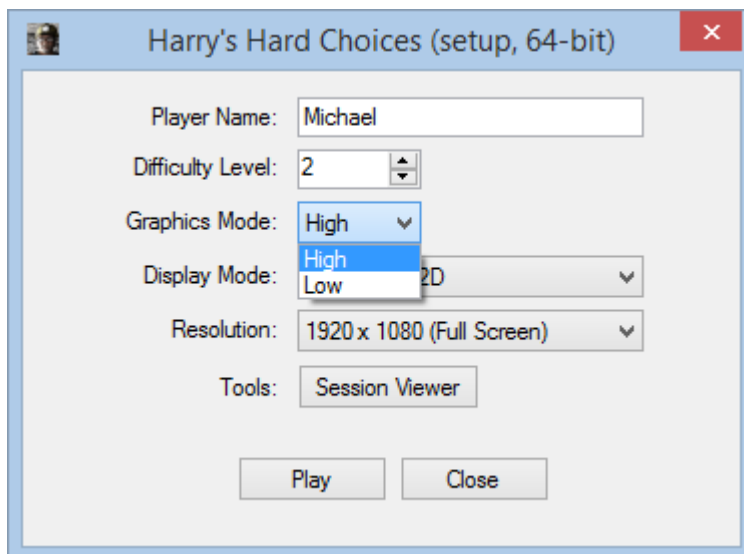
Resolution: The Resolution setting determines the rendering resolution of the game.

The default is Full Screen 2D. A description of each choice is as follows:

Full Screen 2D: This setting will operate HHC in full screen without 3D support. This is the default and is the configuration commonly used on most systems (This is the configuration used on Station A in Lexington).

Full Screen 3D (RealD SBS): This setting will generate an SBS image that is compatible with most consumer 3D television sets.

Full Screen 3D (3D Vision): This setting produces a 3D display when used with systems that support nVidia 3D Vision and have a 3D monitor attached. (This is the settings used for Station B in Lexington).

Windowed: This setting causes HHC to be displayed in a window that is smaller than full screen. This setting is typically used on systems without a GPU. When operating in the Windowed mode, the size of the window is determined by the Resolution setting.
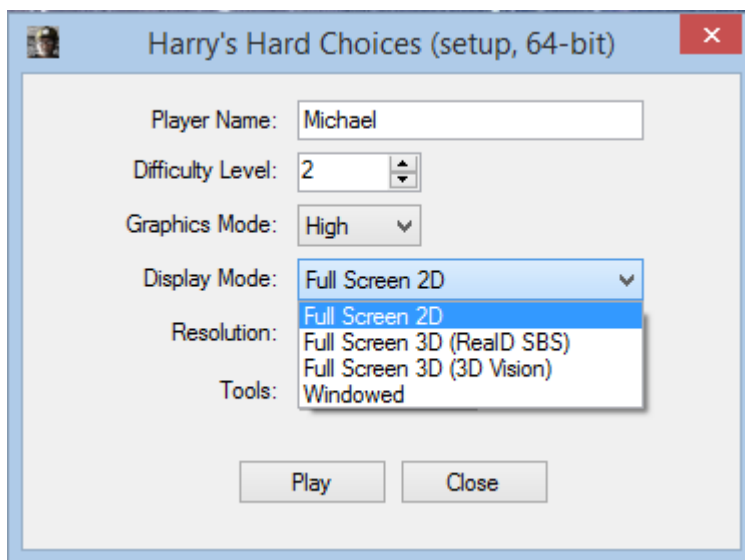
Note that the choices available to the user will depend on the native resolution of their computer's display system. The top choice on the list will always be the system's native full-screen resolution, which is the default setting and the setting that most systems will use. Use of a lower setting might be necessary if they have an extremely high resolution monitor, or the computer in question lacks a GPU. When operating in a full-screen mode, the rendered image is up-scaled to the computer's native resolution (though rendered at the selected resolution). When operating in windowed mode, the selected resolution determines the size of the window.

Tools: While not a setting per se, the tools section allows the user to launch evaluation tools. Currently only Session Viewer is supported. Clicking on the Session Viewer button will launch Session Viewer, which will be preloaded with the most recent session. Other sessions can be selected once Session Viewer is open.

Play: Clicking Play launches HHC using the selected settings. After the game is finished, the following dialog will appear:
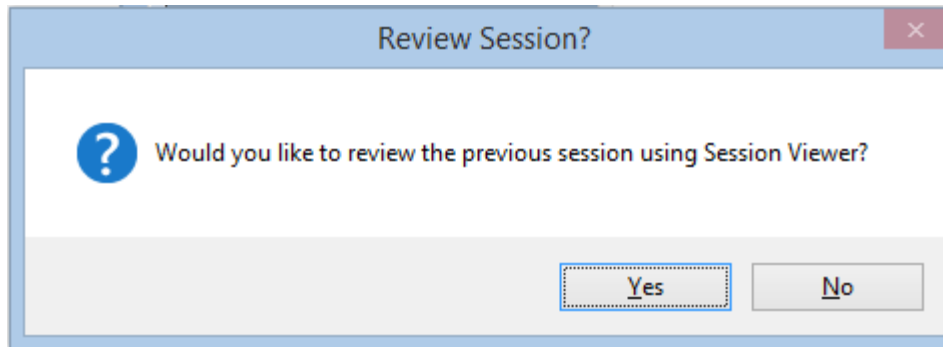
Clicking Yes will launch Session Viewer using the most recent session. Clicking No bypasses Session Viewer.

In either case, the system will return to the HHC front end, allowing the user to change settings and play again, or exit HHC all together.

Close: Clicking close exits the HHC front end.

Troubleshooting

Refer to the troubleshooting procedures below if you experience any problems running Harry's Hard Choices. These procedures are limited to user-correctable issues that might occur if the game or computer that it is running on is not properly configured. For issues not listed below, contact the software publisher.

Low or Unusable Frame Rate

Frame rate is generally a function of the capabilities and resources of the computer on which the game is running. However, if your computer meets the minimum hardware specification and you are experiencing an extremely low to unusable frame rate, then the problem should be correctable. As discussed above older, less compatible computers or computers without GPUs can be put in Low Graphics Mode in game start up.

Map

When playing HHC with the Xbox controller, and the map has panned off the screen, you can bring the map back into view by pushing straight down on the left joystick will return you to your way point in the game. It will re-center around your character and allow you to see your location.

In addition, to zoom in or out on your map when playing with Xbox controller, utilize the left (out) and right (in) bumpers located on the top of the game controller. These directions have been provided on the diagram of the controller in this training manual but are often popular questions asked while playing the game. It is recommended that the diagrams be made available next to the gaming station during game play to support the usability of the game play.

Clip Board

During gameplay the clip board is utilized at important learning points in the game. By selecting "C" on the keyboard or "X" on the Xbox controller, you will be able to raise and lower the clipboard as needed.

Stuck?

Usually if it seems you are not moving in a situation or there is a feeling of "waiting around", it simply means that the game characters have had a conversation or there is a conversation in progress and they will be awaiting your reply so the game can move on to the next event. One way to notice if you need to make a post-conversation choice is if you see a "Half Carat" (>) on the far left or right hand of your screen. Move so that the people come into view. You will then see the characters with the "Full Carats" (<>) in front of them, signifying that a choice has to be made.

All of the topics above are usually experienced when first playing Harry's Hard Choices, but once the player has had the time to play and experience the game, the above topics resolve themselves as the game player becomes more familiar with the controllers and the game.

Evaluating Training

Harry's Hard Choices is an excellent platform for assessing learning. The mechanics of the game itself allow the learner to keep score based on their decision making and progress through the game scenario. Assessing student learning is an important aspect of training. Assessments allow the trainer to have a better picture of their student's learning process and their progress and provide remediation as necessary.

Formal vs. Information

The two major types of assessment: formal and informal. However different informal and formal assessments are both equally important. Formal assessment will be evident in the game by the scoring mechanism and will support the diagnostic element of assessment. Along with formal assessment, informal assessment is another tool to help the trainer document the effectiveness of the training. Informal assessment requires the trainer to be very alert to the types of questions the students are asking and the discussions that take place before, during, and after the training.

Assessment

Name_____   Training Date_____

MSHA Training Topics	Harry Hard Choices Objectives- During Gameplay the Trainee demonstrated:	Yes	No
Mandatory health/ safety standards	• Proper use of PPEs		
Transportation controls	• Showed knowledge of pros and cons of using transport during gameplay.		
Transportation controls	• Effectively made safe choices while interacting with transport.		
Communication systems	• Proper and effective communication with the crew		
Communication systems	• Used map to make informed choices for evacuation and crew communication		
Barricading/escape emergency evacuation/firefighting plans	• the ability to use the map effectively for navigation and safety		
Barricading/escape emergency evacuation/firefighting plans	• When and under what circumstances to enter a refuge chamber		
Roof/ground, ventilation	• Showed consideration of the ability of the fire to spread along established ventilation paths according to airflow.		
First aid	• User considered crew health and fatigue in evacuation strategy and adapted based on the real time events in the game.		
Recognition and avoidance of electrical hazards and other hazards	• Demonstrated awareness of possible electrical hazards and spark/fire hazards.		
Prevention of accidents	• Appropriate monitoring of Harry and the crews' fatigue and morale levels		
Prevention of accidents	• Successful interaction with the action bar to assist in decision making		
Self-rescue/and respiratory devices	• Knowledge of usage levels of SRLDs and storage caches		
Mine gases	• Ability to check CO_2 levels at important parts of the self-rescue scenario		
Emergency/medical procedures; escapes and	• Ability to understand the non-verbal warning communications from other miners in the		

MSHA Training Topics	Harry Hard Choices Objectives- During Gameplay the Trainee demonstrated:	Yes	No
emergency evacuation plans;fire warning signals and/firefighting procedures	scenario		
Emergency/medical procedures; escapes and emergency evacuation plans;fire warning signals and/firefighting procedures	• Correct usage of safety tethers and lifelines The value of the mini-map		
Health and safety aspects of the tasks to be assigned	• User applied risk analysis to balance fast evacuation with the current environmental hazards and crew morale, crew health, and crew fatigue.		

Notes:

Post Session Evaluation- "Session Viewer"Report:
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_____

Additional Comments:
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References

Galbraith, M. W. (2004). In M. W. Galbraith, *Adult Learning Methods: A Guide for Effective Instruction (3rd ed.).* Malabar, FL: Krieger Publishing Company.

MineSAFE. (n.d.). Retrieved from MineSAFE: A Platform for Serious Games in Mine Safety Education: http://www.newmedia.org/game-based-learning--what-it-is-why-it-works-and-where-its-going.html

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Harry's Hard Choices