

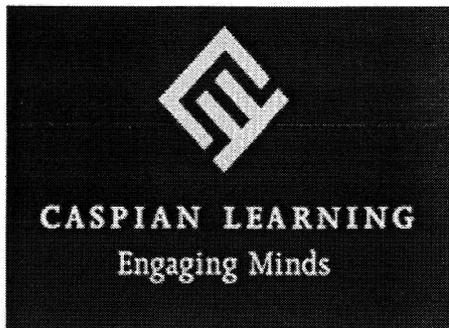
Tools, Techniques, and Applications: Normalizing the VR Paradigm

by

Graeme Duncan

Tools, Techniques, and Applications:

Normalizing the VR Paradigm



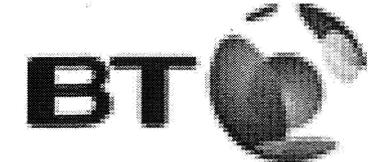
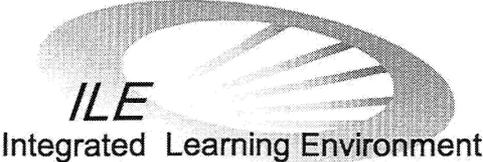
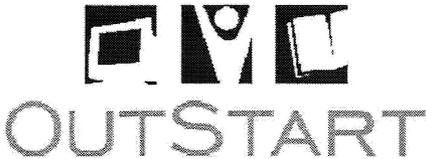
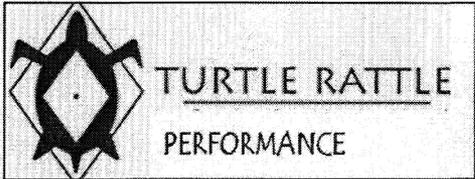
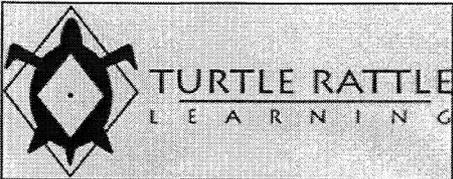
Graeme Duncan



MODSIM 2007 VA

Oshynee Enterprises

Organizational Performance Solutions



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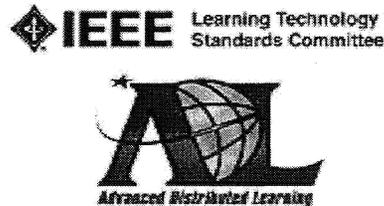
Recurring Solution Requirements

- Mature Technology
- Enabled Work Force
- Affordability
- Precision
- Articulation
- Flexibility
- Maintainability

SCORM

“...Until now, it has been extremely difficult to track user activity within 3D games environments to industry standards. As such, training departments have been unable to monitor many learning improvements through this type of approach. LINE worked closely with Caspian Learning to produce the **industry's first SCORM conformant 3D serious games that feed user data and activity results to SCORM v1.2 and 2004 conformant Learning Management Systems (LMSs).**”

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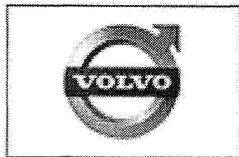
Thinking Worlds™

Who are Caspian?

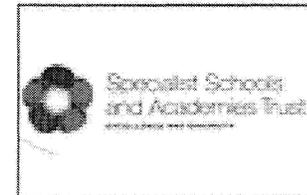
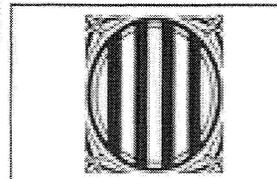
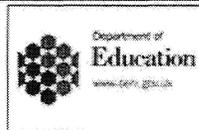
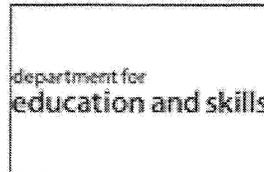
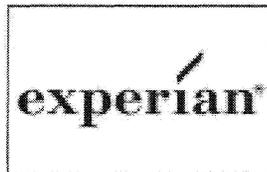
Global Leaders in the use of 3D games technology for education and training:

- Motor
- Finance
- Technology
- Pharmaceuticals
- Publishing
- Education

Delivering programmes for organisations such as:



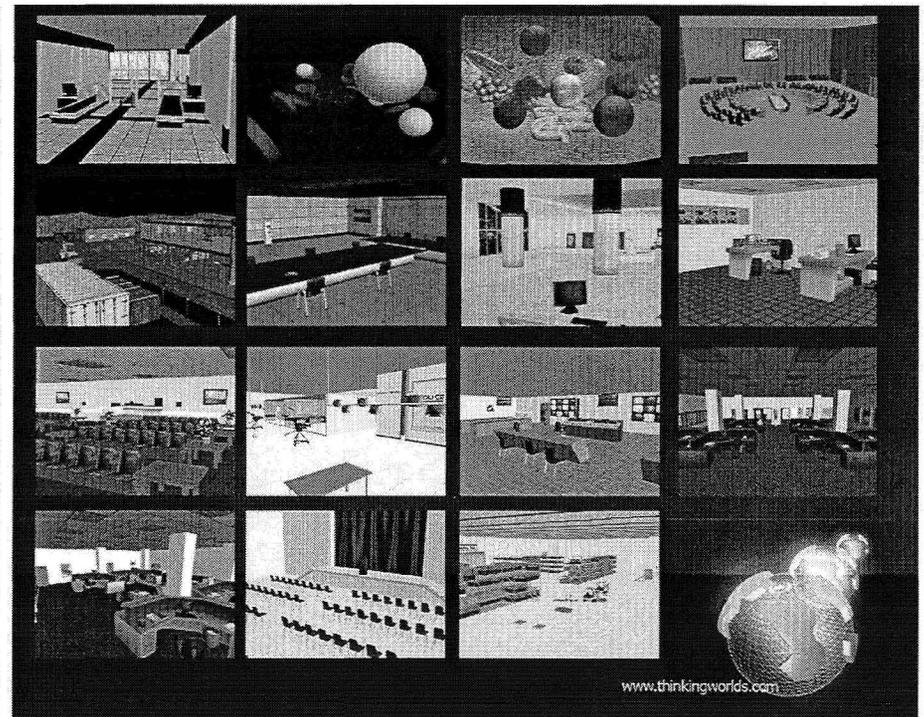
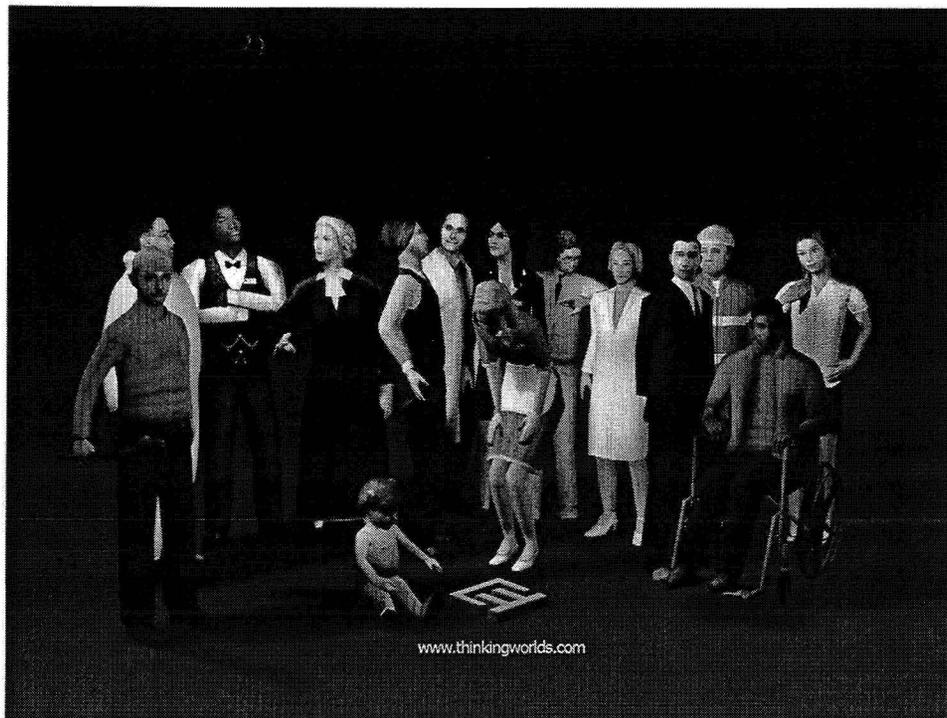
PRICEWATERHOUSECOOPERS



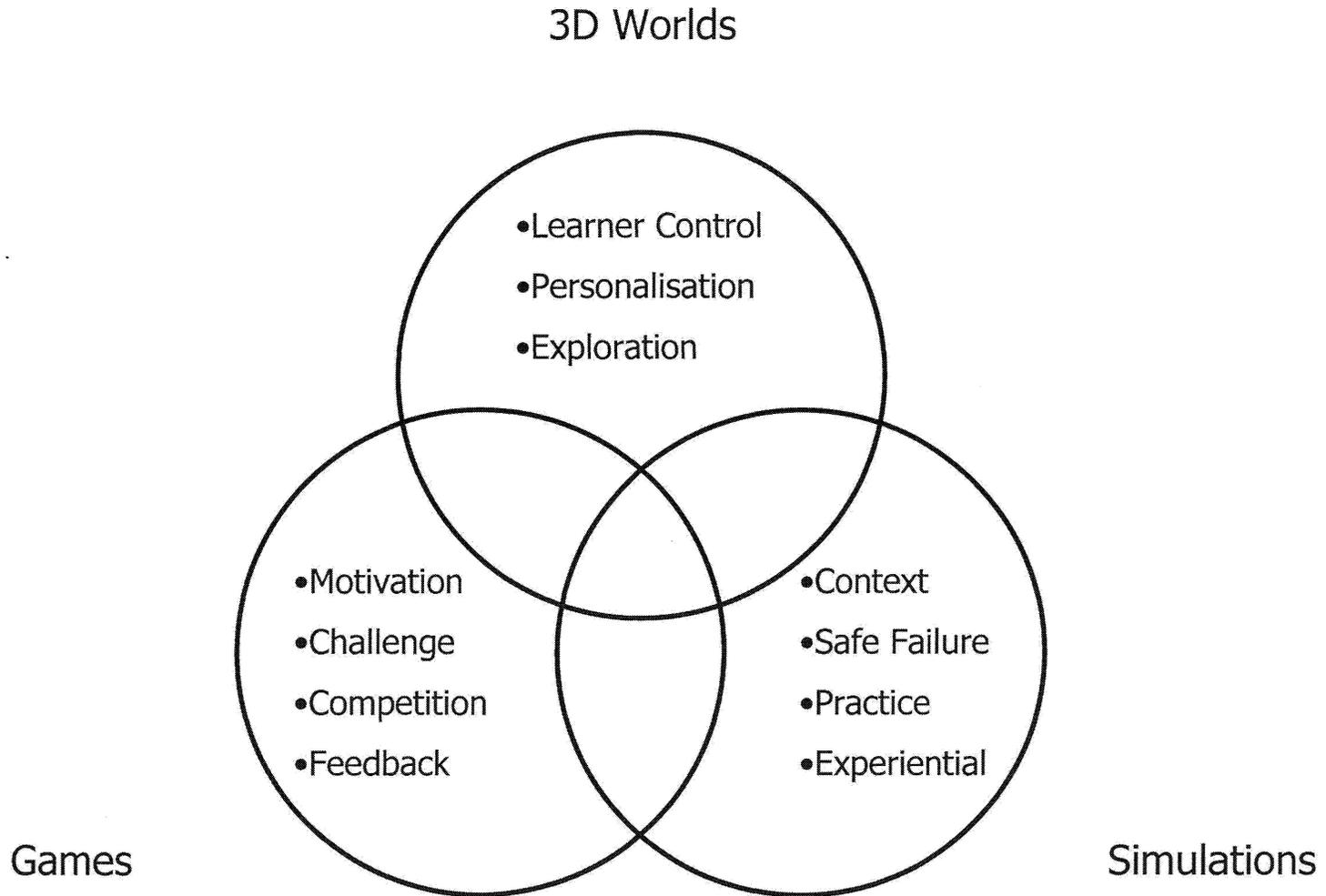
What does Thinking Worlds do?

“Delivers performance simulations and problem solving challenges in engaging 3D worlds, to improve learner motivation and skills”

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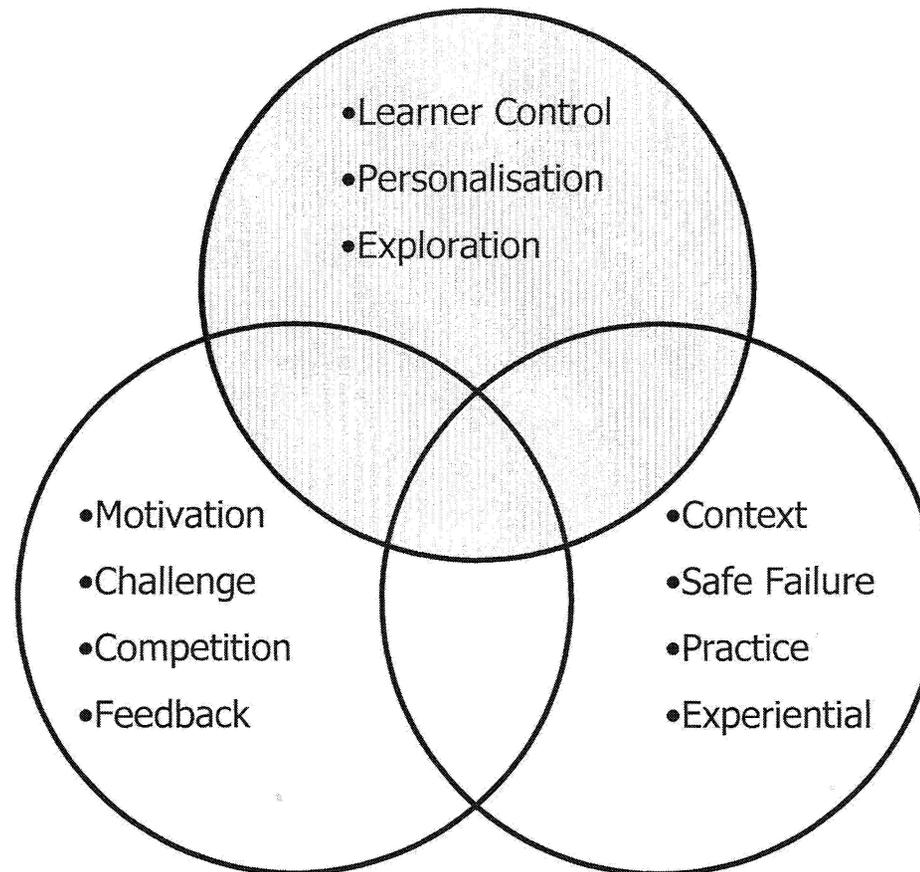


Games , Sims and 3D worlds



Caspian Approach - The best of 3 Worlds

3D Worlds



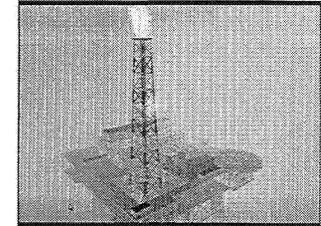
Games

Simulations

Types of learning journey

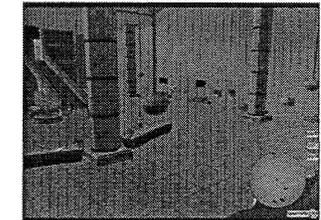
■ Trail Worlds™ - *Directed Journeys*

- Journey = Structured, Linear, Sequentially Progressive
- Outcomes = Prescriptive, Explicit, Task based
- Use cases = Process, Procedure, Compliance, Regulatory, Knowledge



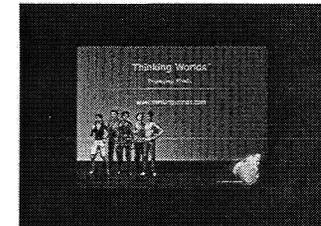
■ Quest Worlds™ - *Branching Journeys*

- Journey = Unfolding, Branching Structure, Personalized
- Outcomes = Overall aims & goals with differentiated routes
- Use cases = Scenario based, Skills Improvement, Problem Solving



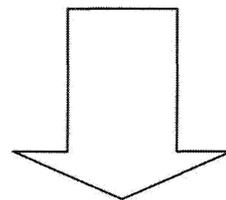
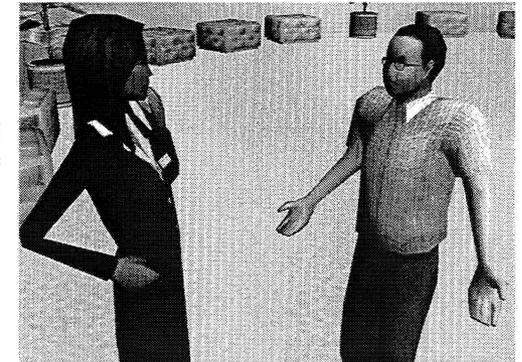
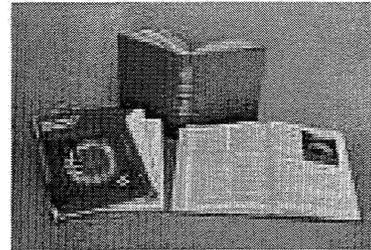
■ Discovery Worlds™ - *Open Journeys*

- Journey = Open ended, Learner controlled, Free form
- Outcomes = Engagement, Self Direction
- Use cases = Exploration, Familiarization, ITC's, New Roles



Five appropriate types of learning

1. Dull, Dry Content
2. Risk Mitigation
3. People Oriented Interactions
4. Exploration and Familiarisation
5. Decision Making and Problem Solving

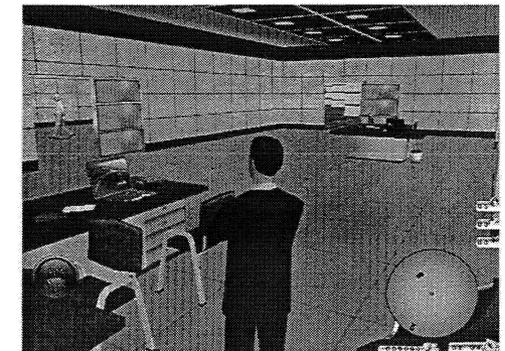
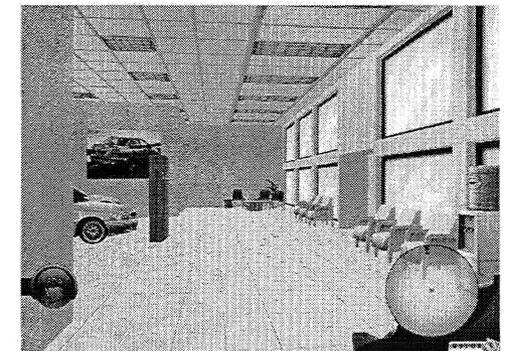
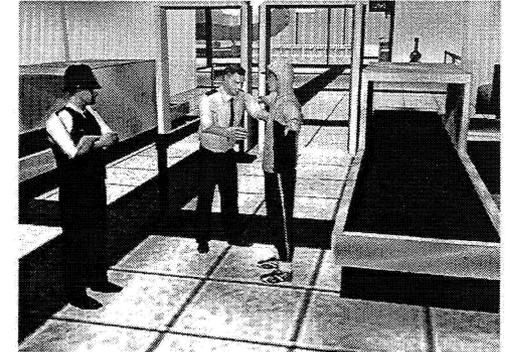


Isn't this the majority of learning we do?

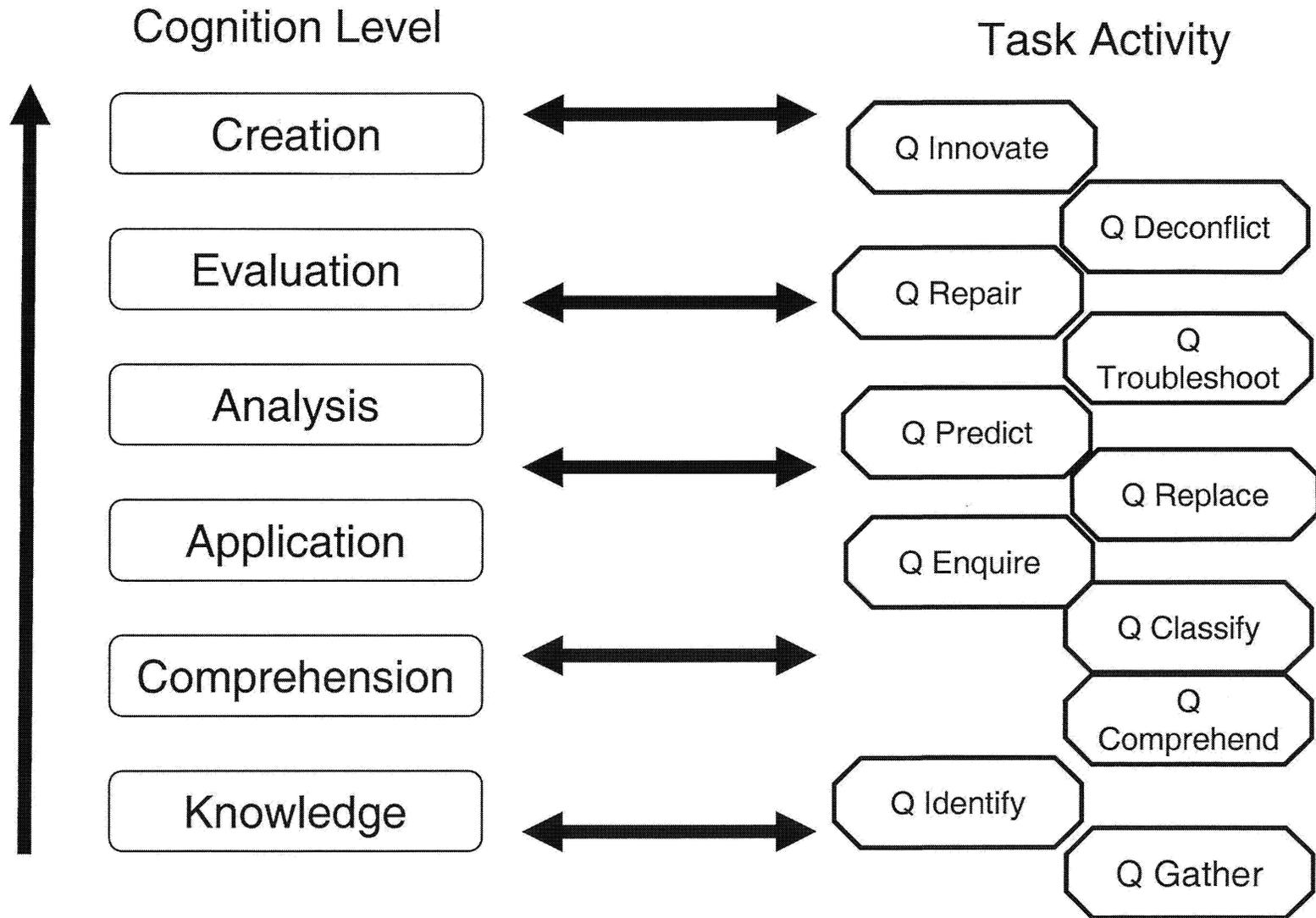
The technology

Thinking Worlds™ Applications

- Use thinking skills to achieve learning outcomes within 3D virtual world
- Subject specific applications
- Mapped to objectives
- Measure Thinking Skills performance



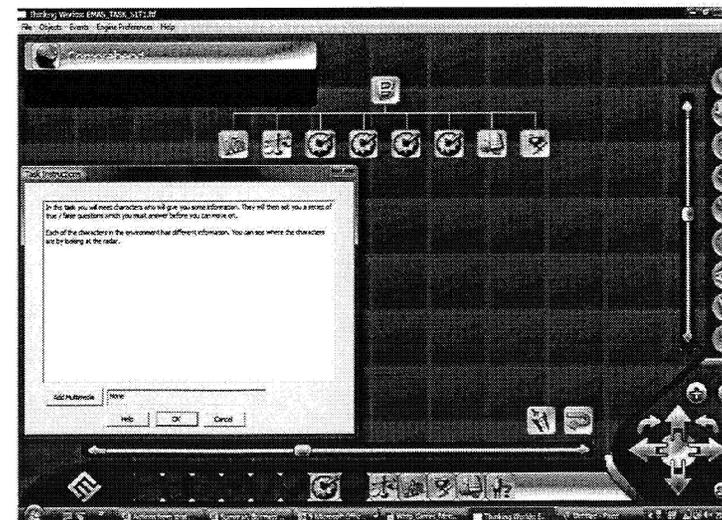
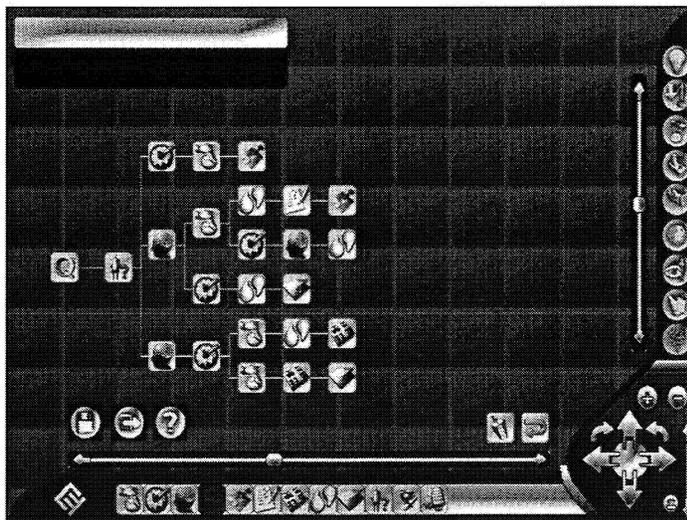
Levels of Learning / Performance



The technology

Thinking Worlds™ Authoring tool

- A rapid development tool
- Delivers flexible solution
- Pedagogical templates
- Updateable
- Web centric
- Cost Effective





Oshynee

Deploying Thinking Worlds TM

Seminole Hard Rock Hotel Use Case

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Oshynee Approach to Evaluation

- The purpose of training, or managed learning, is to achieve predictable business outcomes.
 - A problem with training is that ideal behaviors in a training environment do not often predictably provide for performance under working environments
 - The performance domain is multivariate with environmental and internal barriers to performance
 - “Work experience” or “experiential learning” is the primary determinant of performance in the ‘real world’
- Oshynee evaluates workforces against workplace standards to determine proficiency and provide feedback that resolves differences between what has been learned and what is needed for success

Technical Description

- Oshynee's precision Learning Objective performance factor rubrics with associated behavioral anchors integrates with Thinking Worlds™, to provide event data recording and dynamic prescriptive feedback.
- Thinking Worlds™ provides SCORM parametric data for reporting within the game and within overarching curricula or workplace evaluation strategy.
 - Open-sourced, browser-based digital dashboard reporting tools collect data from TW, LMS, LCMS, HR, and workplace metrics or control systems
- The games may be delivered across the internet or in a range of networked and stand-alone methods using the delivery model (s) required by the host organization.

It is your first day at work. The General Manager is waiting for you in the lobby area.
You must first talk to her to begin your learning journey.



Information Store

When looking in the bathroom which of the following was not up to the specified standards.



M.C.Q.



Activity Information

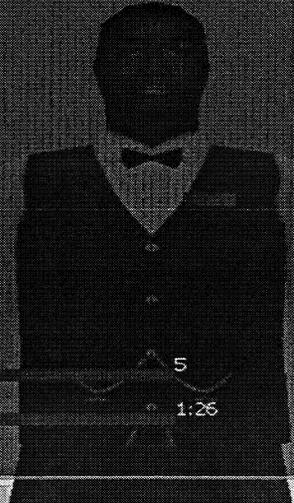


Select Solution

Behaviour successfully completed

You completed all of the actions required in the behaviour

Overall performance: 100%



Gold collected from this behaviour: 5

Behaviour duration: 1:26

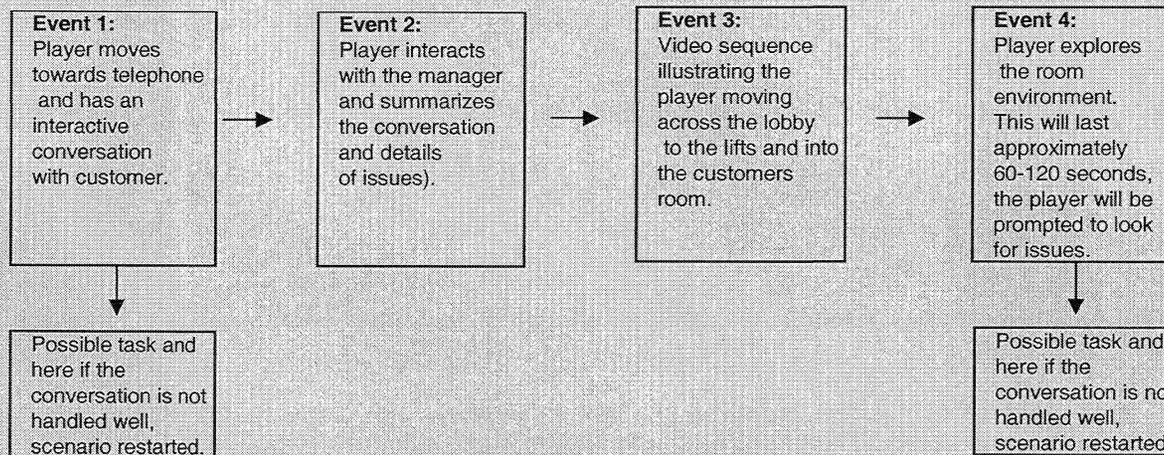


Text to Speech

Example Storyboard-Rubric

Gaming Scenario: *Irate Customer: Issue surrounding a sub-standard room.*

Hard Rock Casino: STORY BOARD OF EVENTS



Rubric Performance Dimensions

Event 1: Verbal / Nonverbal Communication Adherence to Policy Problem Identification Solution-Oriented Decision Making Passive/Aggressive	Event 2: Verbal / Nonverbal Communication Adherence to Policy	Event 3: Safety Adherence to Policy	Event 4: Adherence to Policy Problem Identification Verbal / Nonverbal Communication
--	--	--	--

- Each event within the Simulation contains specific behavioral aspects of customer service which measured against standard performance criteria across multiple levels of proficiency

Performance Criteria Outlined in Example Rubric

Performance Factor Dimensions: Knowledge and skills associated with a given task

Performance Factor Dimensions	Performance Factor Dimension Definitions	Behavioral Anchors				
		Passive		Optimal	Aggressive	
		Sub-Optimal UNSET	Sub-Optimal		Sub-Optimal	Sub-Optimal UNSET
Verbal Communication	The extent to which the job incumbent uses proper vocabulary (e.g., "Certainly", "I'd be happy to", "My pleasure") and engages in empathetic communication techniques with guests	Communicates in a manner that is difficult to follow. May tend to either fragment thoughts or ramble; Communicates with limited energy, confidence, or personal conviction.	Communicates with respect and courtesy toward all customers; Uses a tone of voice that sounds courteous or pleasant. Other nonverbal behaviors do not contradict the customer service message; Uses familiar language but may also use	Communicates with respect and courtesy toward all guests at all times; uses a tone of voice that suggests "I want to help." Vocal tone and other nonverbal behaviors are consistent with a positive, customer service message; uses precise, concrete, jargon free language.	Communicates with respect and courtesy toward some customers;	Communicates with elevated levels of negative
Solution Oriented Decision-Making	The extent to which the job incumbent considers the relative costs and benefits of potential actions in order to choose the most appropriate solution, while meeting the guests needs, and maintaining a goal directed activity	Does not choose solutions with the organization's best interest in mind; makes poor decisions that do not meet the guests needs	Chooses solutions without regard to the relative costs and benefits of the action at hand	Considers the relative costs and benefits of potential actions in order to choose the most appropriate solution, while meeting and exceeding the guests needs, and maintaining a goal directed activity	Works for the customer by trying to identify mutually beneficial solutions to problems; the guests needs are met, however, expectations are not exceeded	Chooses solutions without regard to the guests needs or organizational goals
Problem Identification	The extent to which the job incumbent identifies the potential problems and/or guests needs	Unaware of problems in the environment or guests needs	Identifies obvious needs when clearly stated by the customer. However, generally does not probe for additional information by asking questions, etc. in	Identifies additional needs of customers by asking questions and listening actively (summarizing, paraphrasing, asking questions, etc.).	Identifies guest needs, however, may probe too much for information	Asks to many questions, invasively probes for information, however does not successfully identify guest needs
Safety	Extent to which the job incumbent creates a safe, secure, accident free environment, and is aware of all fire and safety emergency procedures and reports security risks immediately	Fails to comply with safety procedures/policy and detect safety hazards in the environment	Adheres to safety procedures/policy, however, does not actively seek out potential safety hazards	Creates a safe, secure, accident free environment; is aware of all fire and safety emergency procedures; reports security risks immediately	Adheres to safety procedures/policy, however, continuously seeks out potential safety hazards to the point of guest disturbance	Produces new safety procedures/policy, however, they are often unneeded, costly and time-intensive
Adherence to Procedures	Extent of compliance with company endorsed principles	Fails to comply with organizational procedures/policies/principles	Complies with organizational endorsed procedures/policies/principles when prompted	Complies with organizational endorsed procedures/policies/principles; adapts when necessary to meet customers needs	Operates strictly according to policy, without regard to exceeding customer standards	Operates strictly according to policy, without regard to meeting customer standards
Passive/Aggressive	Extent to which job incubate reacts/responds negatively or impulsively to guests	Shows no concern for needs/rights of others	Deferential to others, submits easily to guests needs, rights, or judgments	Balances guest needs/rights with that of the organization and your own	Initial deference, followed by aggression; however, able to meet guest needs	Reacts/responds negatively or impulsively to guests needs, rights, or judgments

Behavioral Anchor: Standard specific for Passive and Aggressive behaviors

Event Response to Performance Factors

Event 1	Guest Role	Customer Service Representative Response Options	Behavioral Steps Measured	Rubric Performance Factor Dimensions
Player moves towards telephone and has an interactive conversation with angry customer.	"Hello. Is that reception? It's Mr. Jenkins here on the 4th floor. I've just checked in after a long haul flight, and I must say my room is an absolute disgrace."	1) Hello sir, yes this is reception, due to technical difficulties some of our guests are experiencing sub-standard rooms, we currently do not have a time frame as to when we will be able to address these issues.	1. Active listening	Verbal/ Nonverbal Communication
		2) Hello, yes this is reception. I'm sorry to hear that your room is not satisfactory. Can I ask what the problem is Mr. Jenkins?	2. Restate the problem	Adherence to Policy
		3) Mr. Jenkins I can only apologize. This is totally unacceptable, firstly may I offer you a complementary meal and drinks whilst I contact house keeping?	3. Accept responsibility to the problem	Problem Identification
	"Excellent, that's great. I presume I can bring my family?"	1) I'm afraid the complementary meal is limited to one sir, however, I can offer you a 50% discount on the other members of your party.	4. Determine course of action	Passive / Aggressive
	"I suppose that will have to do, I can't say that I'm happy."	2) Of course not a problem, can I just ask what room you are in so that I can apologize in person.	5. Follow-up with guest	
"I suppose that will have to do, I can't say that I'm happy."				



Multiple Choice Question

Feedback

Event 1:

You had the following options to choose from concerning Mr Jenkins call to Reception. Your answer is bolded. The correct answer is in italics.

- 1) Hello sir, yes this is reception, I'm sorry that you hear some of our guests are experiencing subtle technical issues, unfortunately we do not have a timeframe as to when we will be able to address these issues.
- 2) Hello, yes this is reception, I'm sorry that you hear some of our guests are experiencing subtle technical issues, unfortunately we do not have a timeframe as to when we will be able to address these issues.
- 3) **Mr Jenkins, I can only apologise for the inconvenience that you have experienced. I will try to get you a complimentary room for the night.** *Mr Jenkins, I can only apologise for the inconvenience that you have experienced. I will try to get you a complimentary room for the night.*



Scenario-Driven Assessment

- Simulations and games provide authentic situations and participant responses against idealized criteria.
- Performance metrics are automatically captured during key decision points/events within the scenario
 - Measuring and providing feedback on performance within each scenario event
 - Performance task decomposed into a series of measurable behavioral actions
 - Performance measured against standardized performance criteria
Performance Factor Dimensions (PFDs)
 - *Event branching provides primary dynamic feedback*
 - *Emphasis is on problem solving using authentic policy / resources*
 - Customized to meet performance objectives / client needs
 - May vary from site to site

Example Learner Dashboard



OSHYNEE

Oshynee Proposal
Evaluation

Backward *Forward* *Exit* *Navigation*

Game Based Evaluation 2 OF 2

Evaluation of Demo

► Evaluation Dashboards

Learner Supervisor Manager Corporate

Customer Service Evaluation Results: Mr. John Smith

Dimensions of Overall Performance						
	Customer Service Game Scenes Completed	Verbal & Nonverbal Communication	Solution Oriented Decision-Making	Problem Identification	Adherence to Procedures	Passive/Aggressive
Storyboard Events	Event 1					
	Event 2		N/A		N/A	
	Event 3		N/A	N/A	N/A	
	Event 4			N/A	N/A	
	TOTAL					

Scaling Legend	
Aggressive	
Sub-Optimal UNSAT	
Sub-Optimal	2A
Optimal	
Sub-Optimal	3P
Sub-Optimal UNSAT	2P
Sub-Optimal UNSAT	

Learner Dashboard



Oshynee Proposal
Evaluation

Game Based Evaluation

2 OF 2



Learner Supervisor Manager Corporate

Learner Feedback Drilldown

Evaluation of
Demo

► Evaluation
Dashboards

Customer Service Evaluation Results: Mr. John Smith

Dimensions of Overall Performance

Behavioral Steps to Perform	Event 1: Player moves towards telephone and has an interactive conversation with customer.	Verbal & Nonverbal Communication	Solution Oriented Decision-Making	Problem Identification	Adherence to Procedures	Passive/Aggressive
	Active Listening		N/A	N/A	N/A	N/A
Restating Problem		N/A		N/A		
Accepting Responsibility		N/A	N/A			
Providing Course of Action			N/A	N/A		
Follow-Up		N/A	N/A			

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Supervisor Dashboard



Oshynee Proposal
Evaluation

Game Based Evaluation

2 OF 2



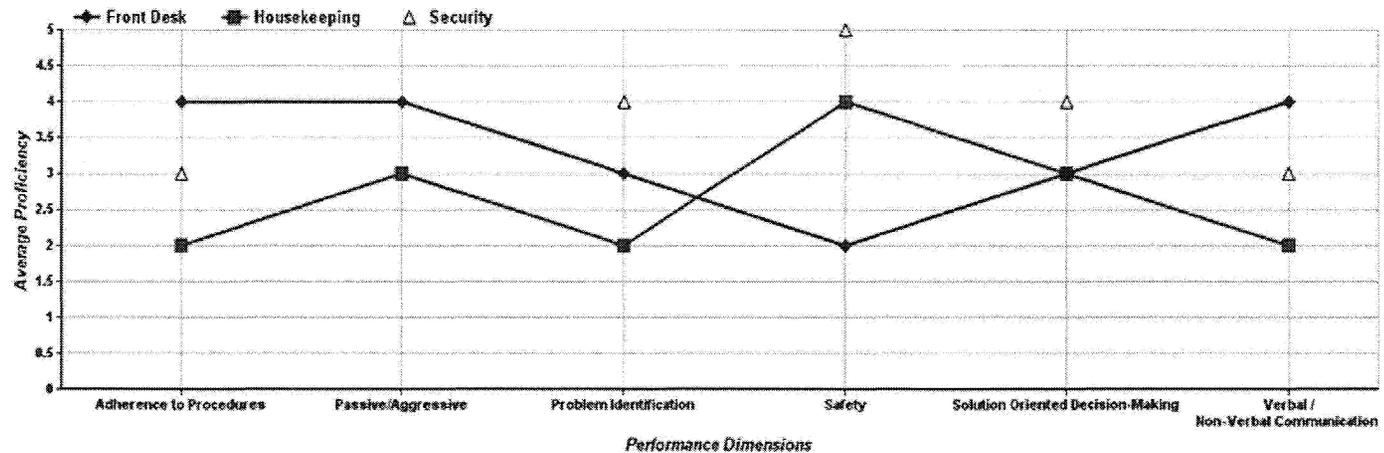
Learner Supervisor Manager Corporate

Evaluation of
Demo

Supervisor Dashboard

Evaluation
Dashboards

Learner Proficiency By Job Role



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Correlating Individual and Organizational Performance



Oshynee Proposal
Evaluation

Game Based Evaluation

2 OF 2



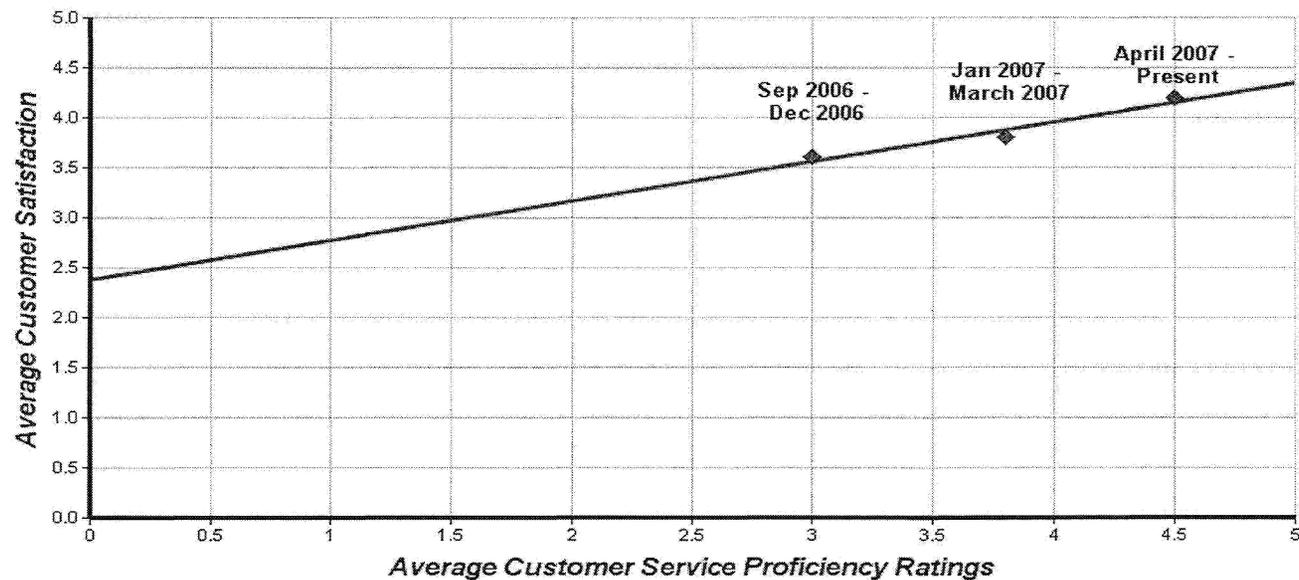
Learner Supervisor Manager Corporate

Evaluation of
Demo

Corporate Dashboard

Evaluation
Dashboards

Customer Satisfaction and Incumbant Proficiency



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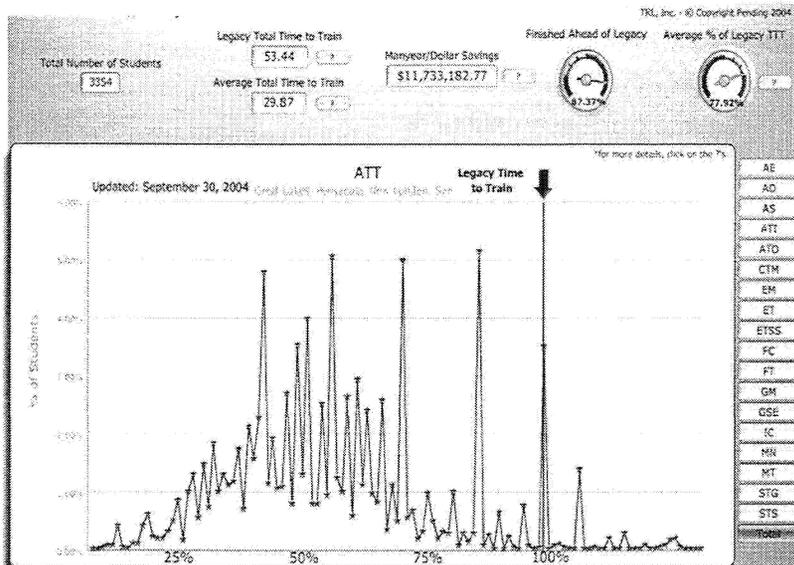
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Performance Dashboards

Management requires transparency across critical organizational processes from initial activity to aggregate output to performance outcome against key performance indicators.

OEI's Performance Dashboards and Control Panel Module (PDCM) suite can integrate with virtually all organizational databases or applications.

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LEDC

Welcome

TURTLE LEARNING

Change Rate: IC

Change Room: Virtual Classroom

Pace Legend

- Exemplary
- Above Average
- Average
- Passive

Course Pace

Topic Pace

Topic Pace

Name	Current Open Content
CLEMONS, MARK	Ship Control Order and Indicating System
FRISPEL, MARK	Combat Systems Operational Seq.
RENDEZ, JOSE	Safetybase
MILLER, JEREMIAH	Type F Wind Indicating System
SMITH, SHEENA	Underwater Log System
TATE, RYAN	Valve Position Indicating System
WHITE, PHILLIP	

TATE, RYAN

Start Date: 27-Mar-2006

Projected Graduation Date: 14-Apr-2006

Completed Modules: 11 of 20

Total Projected Days: 18

Days Ahead/ Beyond Average: 2

Update Student Password

Password: *

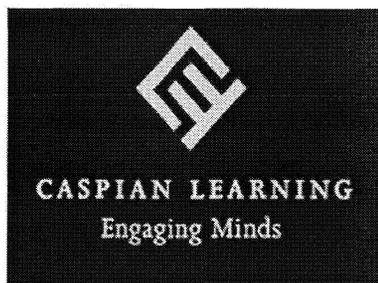
Confirm Password: *

Update

Solution

- Mature Technology
- Enabled Developer Work Force
- Affordability
- Precision
- Articulation
- Flexibility
- Maintainability

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<http://www.caspianlearning.co.uk>



<http://www.oshynee.com>

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Solution Benefits

- **Leveraging the Thinking WorldsTM game engine** allows Oshynee to develop simple or complex situated performance environments.
- Supports a variety of ISD Approaches but naturally provides for **“Guided Discovery”** :
 - Higher learner engagement – because the technologies are extremely interactive and games based, the engagement factor is way beyond other learning experiences
 - Accurate contextualisation – because the learning journeys occur in salient environments and utilise realistic scenarios the context and thus transference are improved
 - Improved thinking skills – because the tasks within the technology are based on learning science, the thinking skills are improved and more reliably transferred to the job
 - Precise performance measurement – the core technology allows event / behaviour relationships to be monitored and reported. Finely grained data can be used to assess performance and transferred into a range of feedback / reports including enterprise digital data dashboards

A Last Word On Why This Method Works

- Adult learners are increasingly driven by perceived relevance to their personal and professional goals.
- When personal goals and resources are aligned to organisationally valued performance, the results are more predictable than when learning objectives are ambiguous and only a passing grade is considered the goal.
- Conservation of effort can be achieved by allowing adaptive paths to performance goals, the adult learner is further incentivized to focus mental energy on the learning task.
- Multiple benefits come from this approach, including improved time to train , time to competency, and greatly enhanced learning transfer on the job.

Why Use Games for Evaluation?

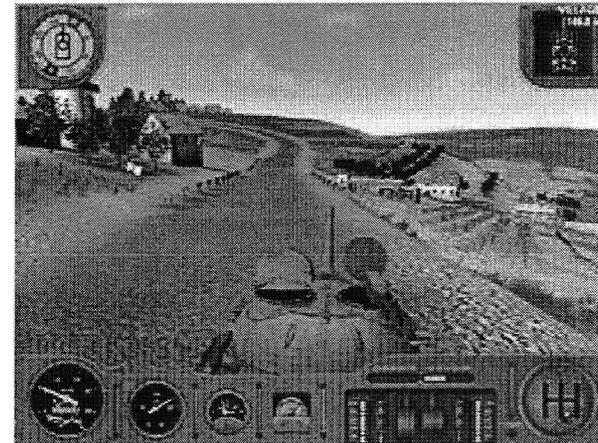
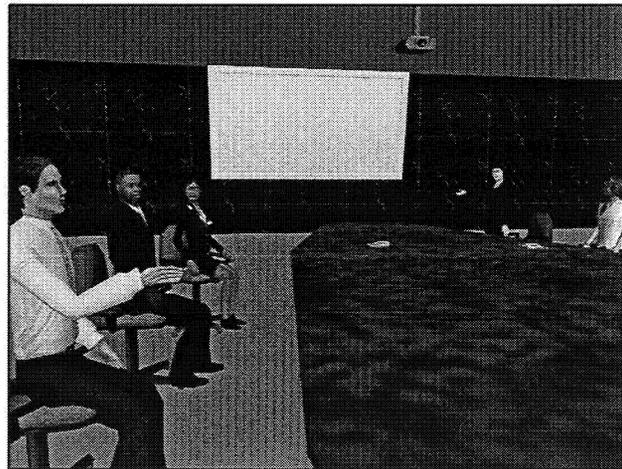
- Activity-feedback dynamic that is understood by the learner as a “cycle of expertise”.
- Relevant situations provide the basis for thoughtful problem solving with game responses that reinforce “good strategies” while stimulating learner refinement of “poor strategies”.
- When the underpinning expert model provides realistic resources the success modeling in a low risk – engaged analytical environment can reinforce organizational values, knowledge precision, and communication articulation.
- Measuring competency while providing practical feedback enhances learning and is more predictive of workplace performance by “normalizing” skills having proven successful and inhibiting behaviors found to be unsuccessful (when a success model is available as an alternative).
- Effective games repeat this cycle again and again within a recognizable structure – overt modeling — guided discovery in practice.... it’s an effective process to develop expertise

Myths About VR

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The Virtual Reality - Myth 1

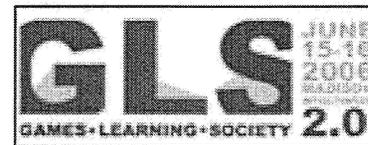
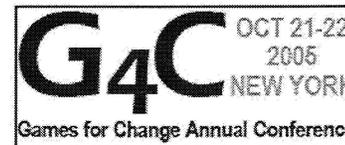
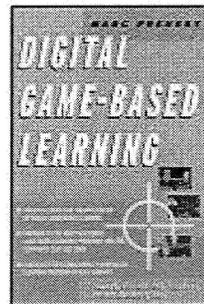
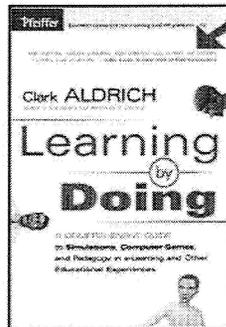
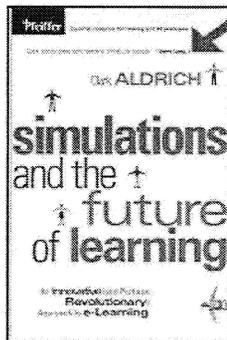
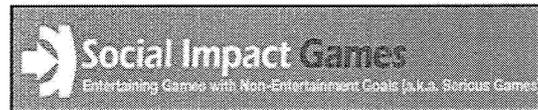
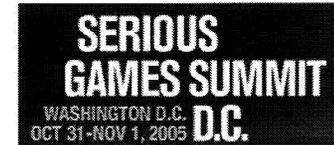
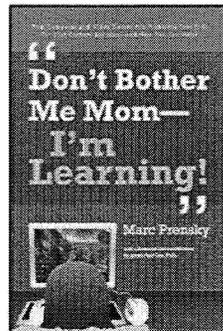
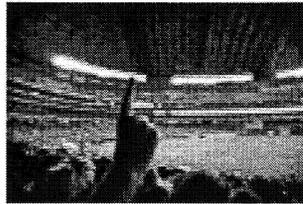
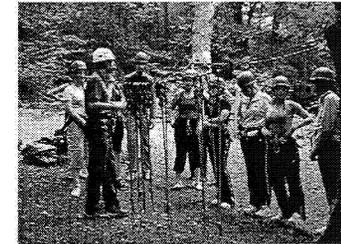
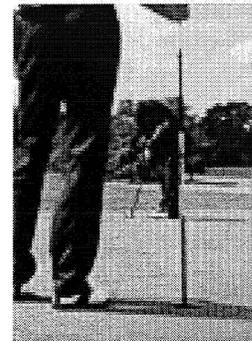
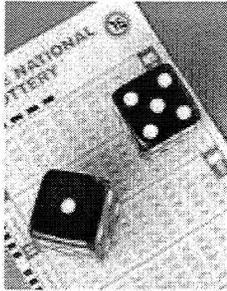
Games and Sims are something new



The Virtual Reality - Myth 2

Games & Play should exist outside work

419



The Virtual Reality - Myth 3

Games can not deliver measurable outcomes

420



A screenshot of a web browser displaying a report titled "Raw scores". The report is dated "15/08/2007 14:11:16". It shows a table with the following data:

User Name	Date	Task Name	Overall Score
Guest	2007-08-03 11:52:37	Volvo MOT Section 1 Task 1	19
Guest	2007-08-03 14:38:42	Volvo Used Cars Section 1 Task 4	85

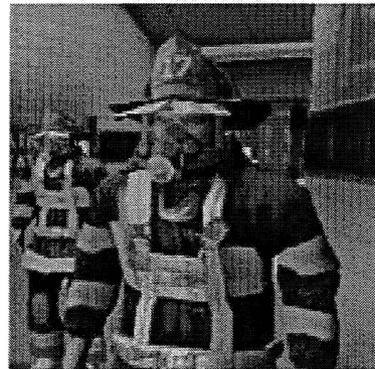
The Virtual Reality - Myth 4

Serious Games mean Serious Money

421



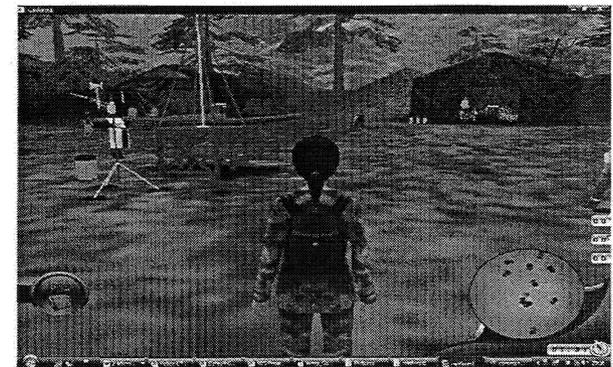
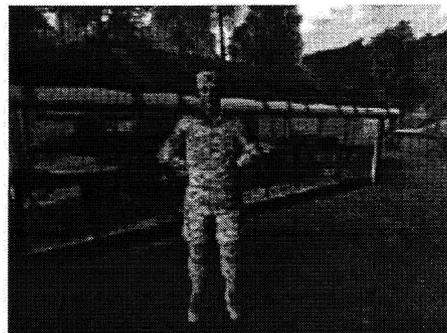
▪ Xbox = £5m



▪ AA & Hazmat =
£2- 4m



▪ Serious games =
£20k - £500k



Measuring Expertise?

- Workers are learners
- Real world experience determines future behaviour
- Experiences and individual perspective are not uniform so the readiness of an individual and their team is not uniform
- Subjective, situational feedback is important but inadequate
- The ability to compare a worker's state of proficiency against a precise human capital demand is needed
- Enter the age of dynamic proficiency measurement and feedback