kilo

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VR Training into Ukraine - #VR4U

Andy Parkin

Kilo Solutions Limited

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INTRODUCTION

The UK Department for Transport prioritised the need to increase training support to the Ukrainian Maritime Educational system, as one of the initiatives within the Ukraine Recovery Fund.

As part of a broader training contract for Ukrainian Seafarers, Kilo Solutions Limited were announced at the London International Shipping Week (Oct2023) as the preferred supplier for a Virtual Reality Bridge Simulator solution into Odesa National Maritime University (ONMU).

Kilo's proprietary Virtual Reality Bridge Simulator, VASCO, was modified for the specific needs within ONMU's Maritime Curriculum, for ColRegs and Bridge Resource Management to be trained both within a Local Area Network or via a Cloud based solution.

Software licences (7) and supporting Virtual Reality Hardware were provided in accordance with the contract agreement, including a Train the Trainer session and some initial training scenarios.

Unfunded, and recognising the nascent component of Virtual Reality within Maritime Education, Kilo and ONMU agreed to collaboratively develop a joint appreciation of how this technology could be optimised for skill development and evaluation, in advance of inclusion within maritime curricula.

The aim of this paper is to capture the lessons learnt from this innovative pilot programme, that all took place whilst real-world Russian aggression was underway and impacting the reliability of power and internet services in Ukraine.

It was to the great credit of the ONMU's professional standards that they remained totally committed to the programme within the most trying of circumstances as they seek to explore and advance next generational training solutions for the betterment of Ukrainian Seafarers.

PROJECT DETAIL

VASCO offers Maritime Training providers with the opportunity to construct scenarios fully aligned with the training objectives sought and as such, a series of 12 x Scenarios were designed to progressively advance Bridge Resource Management and ColRegs skills, throughout a 12 week training cycle.

Jointly focused on knowledge share, Kilo took the instructional lead for the initial 4 scenarios, based on their established experience of delivering commercial training within VASCO, and demonstrated industry best practice standards that should be applied across Maritime training.

The training after the initial 4 scenarios was rotated weekly, between the Kilo and ONMU team, ensuring each organisation benefited from both training receipt and instructional leadership. This provided the opportunity for each organisation to increase complexity within scenario design and pressure test the full extent of VASCO's capability.

Date	Training Lead	In VASCO
06/02/24	KILO	ONMU
13/02/24	KILO	ONMU
20/02/24	KILO	ONMU
27/02/24	KILO	ONMU
12/03/24	ONMU	KILO
19/03/24	KILO	ONMU
26/03/24	ONMU	KILO
02/04/24	KILO	ONMU
09/04/24	ONMU	KILO
16/04/24	KILO	ONMU
23/04/24	ONMU	KILO
30/04/24	KILO	ONMU

Training in Virtual Reality environments provides the opportunity to conduct objective evaluation of individual and collective performance aligned with a series of assessment points / key competencies.

As an integral part of the scenario design, instructor notes were developed to ensure consistency of delivery and which key elements are to be assessed and at what stage of the scenario.

An evaluation report was then generated by the Training Lead after each scenario and shared.

KEY OUTCOMES

Maritime Standards

Despite initial differences in cultural interpretation and application of BRM, ONMU embraced Kilo's recommended BRM standards and adapted their actions and behaviour accordingly.

Aligned to these standards, the ONMU team raised the bar in each scenario reaching a sustained level of professional competence in a very short time.

This rapid increase in performance was measurable and recordable, producing tangible evidence of the efficacy of this type of training.

System Functionality

Despite the afore mentioned challenges of power interruptions and internet reliability, VASCO's core functionality proved to be reliable whilst operating via Cloud Services, with the host server in Frankfurt.

Full system appreciation and functionality took 3 x scenarios to be become instinctive for all and where the unique characteristics of the simulator were accepted.

As a method of continuous assessment, dealing with the issue of skill fade and lack of access to fixed simulators, the technology, software, and training content has been proven to be very effective and should be exploited further.

Training Techniques

ONMU demonstrated their prowess as Maritime Instructors and optimised the technology to include the addition of external and internal comms within scenario delivery, which greatly enhanced the overall learning experience.

Start exercise protocol/procedure to be written regarding giving control when scenario started.

Kilo's instructional staff incorporated best practice guidelines as acquired within a recent IMO model course 6.10, with lessons effectively transferred from fixed simulator training to the progressive virtual environment.
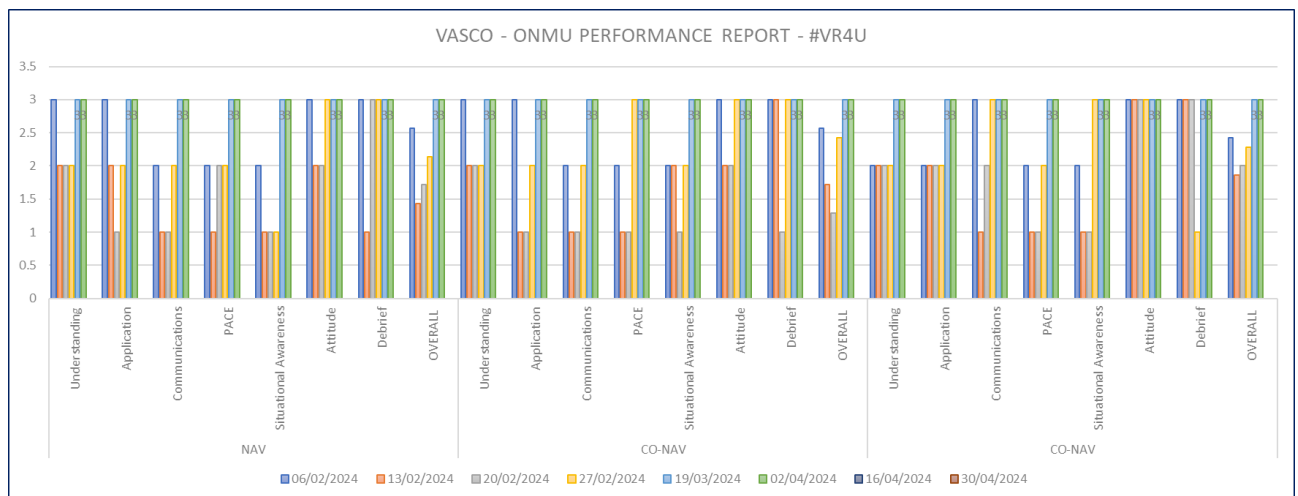

VASCO PERFORMANCE CHART
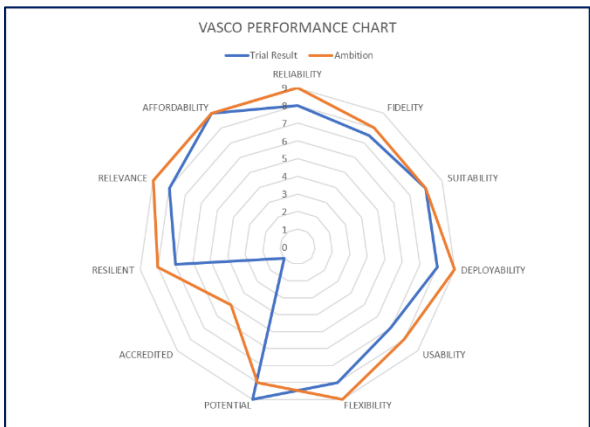
EVALUATION

Throughout the project, evaluation has been conducted during each scenario with a formal report provided on completion with areas for future focus, aligned to a pre-agreed set of competencies. This has enabled ONMU and Kilo to track performance and in turn measure the efficacy of how knowledge is applied within the Virtual Reality Environment.

Report Format:

NAME	POSITION IN VASCO	No.	COMPETENCY	Score	DESCRIPTIONS / INSTRUCTOR NOTES / COMMENTS
vasco			**CLIENT** Odesa National Maritime University		**SCENARIO** 10 - Bermuda Triangle Instructor - Simon Butters / **DATE** 2nd April 2024
GEORGY	NAV	1.1	Understanding	3	Understood all of COLREGs applicable to the exercise, and instinctively shared his knowledge via the shared Mental Model.
		1.2	Application	3	Applied the COLREG's correctly and consistently in the scenario and maintained a safe CPA throughout the exercise.
		2.1	Communications	3	When external communication on the bridge became an issue, he positively took charge and assigned tasks and restored calm on the bridge.
		2.2	PACE	3	Approached each challenge as a chance for growth, tackling them with a constructive and outcome-focused manner.
		2.3	Situational Awareness	3	Always thought aloud and ahead, sharing his actions and his future intentions in order to build the teams situational awareness and mental model.
		3.1	Attitude	3	Eagerly embraced the training program, demonstrating a keen commitment to implementing feedback from the instructor with enthusiasm and consistency.
		3.2	Debrief	3	Provided constructive input and approached criticism as an opportunity for growth and learning.
			OVERALL	3.0	The exercise was successfully completed meeting all objectives and assessment criteria, as he led a safe and sound bridge team.
LEONID	CO-NAV	1.1	Understanding	3	Demonstrated an excellent understanding of the COLREGs, and provided consistent and proactive support to the Georgy.
		1.2	Application	3	Instinctively and accurately supported the Nav on the application of COLREGs during the entire exercise.
		2.1	Communications	3	Maintained clear, precise communication with a focus on outcomes, consistently delivering correct and concise information.
		2.2	PACE	3	Actively seized every chance to challenge the Navigator (PACE), always approaching it with a constructive, outcome-oriented approach.
		2.3	Situational Awareness	3	During the exercise, he adeptly identified all vessels in a positive manner and effectively communicated this to uphold a shared mental model.
		3.1	Attitude	3	Enthusiastically participated in the training program, and it's clear that he actively incorporated feedback from the instructor.
		3.2	Debrief	3	Openly engages in team discussions, addressing areas of improvement without causing disruption to the learning environment.
			OVERALL	3.0	Leonid played a pivotal role in ensuring the exercise's safety, providing continuous support to the Navigator throughout.
GREGORY	HELM	1.1	Understanding	3	Proactive in his steps to support the navigational efforts regarding the COLREG's.
		1.2	Application	3	Demonstrated proactive support for the navigation efforts by effectively assisting the Bridge Team in applying the COLREGs.
		2.1	Communications	3	Identified and announced objects and targets by using all available means.
		2.2	PACE	3	Acknowledges and comprehends the Probe and Alert stages of the PACE Model, actively participating when deemed necessary.
		2.3	Situational Awareness	3	Consistently upheld situational awareness by visually identifying new vessels and monitoring those identified previously.
		3.1	Attitude	3	Enthusiastically participates in the training program, and it's clear that he consistently implements feedback from the instructor with enthusiasm.
		3.2	Debrief	3	During the debrief, Gregory remained open and positive, making significant contributions to the learning outcomes.
			OVERALL	3.0	Gregory successfully fulfilled all Helm duties and made consistent contributions throughout the exercise.
FOCUS FOR NEXT WEEK: 16 April 2024 **BRM STANDARDS**			Continue as a team to share the mental model when applying the COLREGS as below: 1. Identify vessels visually and cross checking with RADAR/ECDIS to see if they have any special conditions, lights/shapes etc. Announcing to team throughout. 2. Determine if risk of collision exists and the vessels CPA, if CPA is above acceptable then announce to team "vessel is not of concern". 3. Discuss the situation, is it PDV crossing, PDV head-on, Overtaking or Keep out of the Way . 4. Discuss your responsibility and the other vessels responsibility. "We are the stand-on/give way/keep out of the way vessel, they are the stand-on/give way/keep out of the way vessel". 5. Announce to the team your planned action and why. "An alteration of course to SB, to pass well clear astern of the vessel on our SB side, maintaining 1.0NM CPA".			

Progress Chart:

VASCO - ONMU PERFORMANCE REPORT - #VR4U

Legend: 06/02/2024, 13/02/2024, 20/02/2024, 27/02/2024, 19/03/2024, 02/04/2024, 16/04/2024, 30/04/2024

AREAS FOR FOCUS

Technical baseline

Recognising the unique operating environment that ONMU are working within, a minimum internet standard should be agreed to ensure optimum system performance.

Acoustic feedback, whilst sporadic, was an occasional and distractionary factor, suggesting a further review on how best to ensure a minimum technical baseline is established that reduces the risk of mutual interference.

Meta Quest 2 and 3 headsets, operating across various levels of broadband speeds proved consistently reliable throughout the training.

VASCO enhancements

Bow Crossing Range (BCR) and Bow Crossing Time (BCT), whilst in VASCO's development pipeline should be advanced to support future training.

Cross Track Error (XTE) is a standard function within most ECDIS systems and is conspicuous by its absence in VASCO's version.

Electronic Bearing Line (ERM) and Variable Range Marker (VRM) required for the ECDIS display.

Collision detection would permit VASCO to be utilised for berthing operations and more general ship handling training activity.

Ukrainian Maritime training would benefit from a Warship variant of VASCO with all appropriate characteristics to advance Naval Maritime Tactics and Procedures.

CONCLUSION

In the expert opinion of Captain Andrew Parker AFNI, as a maritime professional who has undertaken many training sessions on fixed simulators, this project has proven beyond doubt the effectiveness of VR bridge simulation.

Within VASCO, we can achieve pretty much everything that can be achieved in a fixed simulator with regards to effective bridge operations and the type of training performed with ONMU.

In some areas, the VR solution clearly outperforms fixed simulators, which questions the immediate logic of why organisations are investing £millions, without exploiting the rapidly evolving capability of Immersive Technologies.

We have also proven that bridge simulation training can be conducted effectively with instructors, observers and students geographically dispersed, which bodes well for the use of this technology within the future provision of professional training to Ukrainian Seafarers.

VASCO's mantra is that it seeks to Change the face of Maritime training. This is no longer a business aspiration, but a material fact.

Odesa National Maritime University
Since its foundation, ONMU has remained unique in its vocation, purpose, organisational structure as a higher educational institution for Maritime Studies
Home (onmu.org.ua)

About Kilo

We're a global provider of contemporary training solutions for the Maritime Sector, underpinned by a wealth of Maritime, Creative Educational and Technological expertise.
www.kilo-solutions.com