

Online Training and Reporting: Natural Resource Governance Institute

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Abstract—Winner of a 2019 IELA E-Learning Award, Business Division. Petronia is an innovative game-based learning experience designed by Saffron Interactive for the Natural Resource Governance Institute.

Keywords—Natural resource governance, gamification, serious games, immersive games, behavioural psychology.

1 Pedagogical Context

1.1 Description:

We live in a time where people around the world are more aware than ever of the limits of the planet's resources. Those limits apply on a national level too, so it is crucial that countries make best use of their available resources. But the whole area of natural resource governance is so secretive, corrupted, mismanaged and complex, that even well-intentioned citizens and government officials find it hard to penetrate. The jargon and complexity of managing different and often opposing stakeholders makes this area inaccessible to all but a few.

Even those within and studying governance are often siloed in the sphere of knowledge that they cover. The overall understanding of the dependencies and external risk factors that must be managed, as well how decisions can impact on different groups within the short and long term, are not considered. These are the very decision-makers that can enrich their countries with resources that they own, take their countries out of poverty and liberate their nation.

Education is the key to good resource management, but time-consuming face-to-face sessions with years of mentoring were not scalable by the Natural Resource Governance Institute (NRGI).

Instead, a new approach was needed to solve these issues. A digital intervention would be able to achieve reach, but NRGI wanted to go beyond that. They wanted to bring the learning to life and keep it alive by nurturing a community.

That's why it turned to Saffron, a Top 20 Gamification company as voted by Training Industry for five consecutive years and a previous MEDEA winner. Saffron's

experience in game-based simulations with rich media and compelling narratives is second to none.

Real-world political drama has inspired great engagement from all types of generational audiences, from “The West Wing” to “House of Cards.” Everyone is curious to know the machinations and political strategy that underpin policy decisions. Indeed, “Black Panther,” “Game of Thrones” and “World of Warcraft” all remind us of the consequences of unmitigated control of resources and power. NRG and Saffron wanted to harness that engagement for learning purposes by creating something revolutionary. An industry-first role-playing simulation that let learners experience real-world governance and corruption challenges.

We set out to develop a globally available serious game that would empower current and future change-makers in resource-rich countries to navigate the jargon and balance for themselves the tricky decisions of how to manage multiple stakeholders, dependencies and intertwined complexities. They would need to be able to manage revenue, operations, national, regional and local interests, the economy, local culture and industries and so much more.

1.2 Welcome to Petronia



Using gamification principles, underpinned by cognitive and social constructivist pedagogical theories, and real-life scenarios, the learner is made the protagonist in this drama. A challenge is raised, and the learner chooses whether to accept the mission. By segregating the missions to holistically cover different aspects of governance issues, the learner sets their own goals and kindles their intrinsic motivation to actively assimilate new information, whilst building on their existing knowledge.

Petronia explores resource governance policy challenges in an absorptive simulation of a fictional developing country that has made a potentially transformative oil discovery. Online learners join a team of experts deployed to advise the country’s policy-makers in a series of decisions. Not only do learners reflect on policy choices in Petronia, they also “do” by consulting stakeholders, analyzing government and international data and developing recommendations with their team.

Transported into this living, breathing world, learners can hear and seek advice from stakeholders throughout Petronia, analyze government and international reports, and develop recommendations with their team. New topics are introduced through multiple interactive media messengers such as overviews, animations, interviews with stakeholders, data displays, and then questions that test for comprehension. Learners

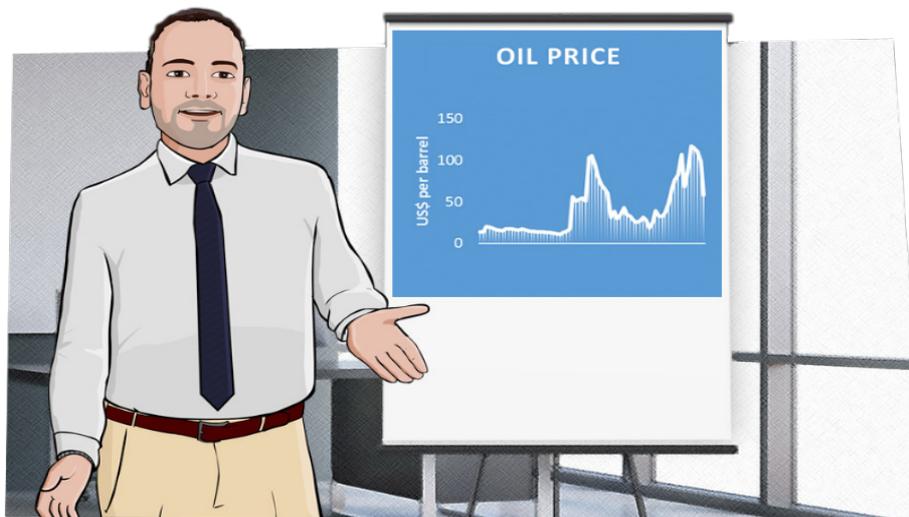
set their own pace as they build their knowledge of the issues, stakeholders and make complex trade-offs in managing resource wealth for development.

Petronia’s immersive narratives are furnished with the best of NRGi’s support toolkit, including case studies, modelling tools, plain-language policy explanations and data tools.

The media flair of the project heightens its vitality and immersion, but that would mean nothing without a memorable narrative. Saffron created unforgettable characters such as Allain Lille, the owner of a petroleum company who spent a fortune looking for oil in Petronia. He took the risk and signed a deal with the old government, so he was poised to reap the rewards. But in last year’s election, a new president came to power, promising a better deal for the people. She has invited four foreign “experts” to advise her.



As a player, you take on the role of that curious foreign adviser eavesdropping on Mr. Lille. You network at a cocktail reception, visit the presidential palace, the capital city’s cafés and markets, and the coastal district of Neftala, where the oil was discovered. Each visit is a standalone mission and you are asked to balance priorities and stakeholders across complex decision making.



You must meet the challenge of advising on how a good deal can be reached, and how the revenue from the oil can be turned into sustainable development for the country's inhabitants. Throughout the process, you are involved in putting forward recommendations, but first you meet your challengers at the National Resources Advisory Council meeting. You must negotiate and weigh up differing interests of ministers, oil dragons, MPs, journalists and local activists.

Next, you must advise on the strategy for how the government should manage and distribute its resource revenues. You visit government departments and rural areas to see the impact on local communities. And so, the missions continue with thoughtful but stunning hand-drawn graphics and life-like animations.

The last mission is set eight years after the government had developed their policy plan. With the president's term about to end, public approval ratings were at a low. Data had been collected on key indicators of the government's resource governance practices. Based on the evaluation of these findings, the learner then develops further priorities for the government to focus on. Here again the player must weigh up policy proposals by different experts and assess the risks associated with these but now with the added hindsight of the long-term effects of policy decisions.

Alongside the front-end of the course, Petronia includes a bespoke reporting solution that helps NRGi to track information as users progress through the training material. This information, including learner demographics, is used to spot where learning challenges take place, improve tricky questions, and target outreach or follow-up based on usage. At the end of the mission, participants are invited to join a community and to participate in broader objectives.

Petronia is a learning intervention whose aesthetic and pedagogical achievement match the importance of the issues at hand. A country's resources should belong to its people, and Petronia allows change-makers in countries developing those resources a chance to overcome the secrecy and jargon that surround the sector and experience the intricacies of resource governance first-hand. It's an intersection of learning tech-

nology and media that is changing resource governance across the world at a time when it is more critical than ever.

2 Target Students and Program Study

The audience for the course is global in nature, and largely comprised of two main groups.

The real core of Petronia’s unique use case is reaching those learners in developing countries that are hard to engage with resource governance learning in any other way. Many of these users have limited ways to equip themselves with the knowledge and practice to achieve good governance in the face of corruption and mismanagement – Petronia gives them both. Often these learners are up against multinational behemoths or secretive governments, so it’s important they get the support they need. Petronia is the first digital learning intervention to provide that.

There are also those using Petronia as part of a broader resource governance journey. This includes officials, activists, journalists and students who are new to extractive sector governance and just beginning to engage with the subject. They may already be participants in NRGi’s other courses or studying resource governance at university. This segment also includes new NRGi staff as part of their onboarding process.

Overall, most of the learners are from a young demographic (between 18 and 35), well-educated, English-speaking and regular users of the internet who expect engaging, focused content in easy-to-digest units. The language and tone reflect this need through clear explanations, powerful dilemmas and short, impactful units. The media itself was carefully crafted to be relatable across cultures in many different countries. It had to be at once inclusive and universally appealing, starring recognizable characters in diverse, custom-drawn locations.

2.1 Pedagogical Aims

Petronia aims to use a globally accessible serious game format to promote fair resource governance around the world by allowing learners to identify the core issues around resource governance and distinguish where their roles sit in the governance and decision chain. After completing the course, users should be able to:

- Contextualize resource governance vocabulary into practical timelines and issues countries face
- Empathize with perspectives of various stakeholders in resource governance
- Identify when and why policy makers may want to incorporate different forms of data into their decision making
- Make the case for transparency to their governments

2.2 Evaluation

Petronia has been explored by almost 6000 learners from all corners of the Earth. 94% of learners surveyed rated their knowledge of resource governance as improved after taking the course in the post-course survey. Additionally, 90% of learners surveyed rated this course as a 4 or 5 out of 5; a glowing response.

Users praised animations and narrative as some of the biggest strengths of the experience, highlighting the importance of media in delivering its learning objectives. One user mentioned that ‘putting pictorial context on the what we have been learning so far has helped to internalize better what I have read, especially the Natural Resource Charter’ (The Natural Resource Charter is one of the most important documents that NRGi uses to build capacity with stakeholders).

Yet perhaps most importantly, Petronia has had an unprecedented effect on NRGi’s target audiences – those in difficult to reach countries and those getting different perspectives to integrate into an overall narrative that augments their other resource governance learning.

Petronia’s audience is vastly diverse, and in priority countries including Colombia, Nigeria and Indonesia, Petronia has so far reached 335 users from these nations, surpassing expectations in terms of usual digital reach.

Indeed, the very first completion of Petronia was by an official from the Ministry of Mines in Somalia, a country NRGi does not work in. Similarly, respondents gave praise in many other new and target territories, indicating the success of the serious game media format in terms of both its widespread appeal and ability to penetrate difficult to reach learning audiences.

We’ve included feedback from some of these below

2.3 Testimonials

“I came across Petronia when I was exploring online for resources for new lawyers in the company, or those who moved from a different sector. I think the topics covered are useful for upstream [extraction at the oil well] colleagues. The missions cover the whole life cycle of oil, from first discovery to developing, which I myself haven’t been around long enough to see! I am a gamer in my free time, and I work in oil and gas during the day so I can speak from both perspectives when I say there are not many games like this available – it is unique.”

Thean See Xien, Legal Counsel, PETROLIAM NASIONAL BERHAD (PETRONAS), Malaysia

“I haven’t come across anything quite like Petronia. The reason I think it is so dynamic is because there are so many different elements to it. You have explanatory-animated videos, but you also have the materials you can dig into for further reading, and you have your briefcase where you can keep your different materials if you need to refer to them later.

I think the thing that stands out to me the most is helping students to understand the different competing interests. That’s the most unique part for me and I think that’s what the students got the most from.”

Tehtena Mebratu-Tsegaye, Legal Researcher, Columbia Center on Sustainable Investment

Petronia was also widely successful as a supplementary tool for those already students of resource governance and was integrated as a cornerstone piece of media into a variety of higher education courses and MOOCs (more details of which can be found in the Media Integration section).

The quotes below are from just two of these:

“Petronia gave me a really refreshing view on what I have been doing so far [in resource governance]. I like the sound, the graphics. It adds a bit of ‘salt and pepper’ into the whole learning process which is nice. I like that it was attached with the NRGi primers, the learning material to go and dig into what you want to learn later.

I really liked the background music. The name of the city was Neftala and ‘neft’ is oil in Azari [language] so I was like ‘Ah! This is very relevant.’ The whole graphics gave pleasure to the eye and they made you feel in a game, and at the same time it could prompt effortless learning. It seemed as effortless learning.”

Nazaket Azimli, Development Manager, Eurasia Hub

“Petronia is quite captivating ... The way it is developed, the style gets your attention. This tool is especially good for non-technical people – it synthesizes and demystifies resource governance in a good way and puts you at the table to think like a government minister, an advisor, or an investor. The added benefit is that you do not even need to leave your desk to learn!”

Nelly Busingye, Publish What You Pay (PYWP) Regional Coordinator, East and Southern Africa

Such first-hand feedback from learners in the target audience is both heart-warming and validation for the design decisions made during the construction of Petronia.

The course also made a splash in the media, with *The Economist* dubbing it Grand Theft Petro. The learning experience that stole the attention of its audience across the globe was featured in both the print edition of the magazine (<https://www.economist.com/finance-and-economics/2018/06/30/fighting-the-resource-curse-through-online-gaming> - ‘even experts will learn something’) and on its Money Talks podcast.

The podcast host remarked on the immersive and human nature of the course and the strength of its characters. Petronia for them was ‘a good way of conveying information and putting you in other people’s shoes... you do get to imagine what it would be like to rub shoulders at a cocktail party with a Chief Executive Officer of a foreign oil company, a Norwegian donor, an investigative journalist and other characters.’

3 Media Type: Online

3.1 Media choice

The free-to-play online format allows the intervention to reach target audiences that often had little experience of digital learning and were used to ploughing through

dense technical content. Petronia blows this out of the water and transports learners into the heart of a nation's resource governance world, whether they sat in a boardroom in New York or an internet café in Kinshasa.

But the choice of media format was about much more than just logistics. Contemporary learners are also consumers, used to a plethora of choice and interactivity. We brought that level of engagement to Petronia using a media-rich "serious game" approach that appeals to NRGi's wide audience. It's a far cry from a conventional 'click-next' e-learning course. The challenge to unlock missions gives it a game feel, while the participation and competency questions in addition to integrated presentations by sector experts reinforce the elearning aspects of the course.

Given the global reach of Petronia, the site is equally accessible to mobile and PC users. Lastly, Petronia is designed to be a self-paced, open-access tool that does not require NRGi staff to facilitate its use. This allows for NRGi learning to have global reach beyond the human resource limits of NRGi in-person trainings.

3.2 Media integration

The nature of Petronia as a self-paced learning tool lets learners around the world immerse themselves at their own pace, and feedback gathered from each end of mission survey shows high ratings of improved understanding on resource governance for independent learners. It can either operate as a stand-alone feature or augment other types of resource governance learning – in both cases it offers something unique.

In more formal pedagogical settings, Petronia facilitates a new approach by combining media-rich learning with other technologies for blended learning. As part of its usefulness and relevancy in a blended learning package, Petronia now features as a pre-residential course tool for a resource governance intensive course under Khazar University, Azerbaijan. The course, commonly referred to as the Eurasia Hub, welcomes learners from across the region for an 8-day residential course. In adding a significant online component to the course beforehand, the learners can now reach a greater depth during the in-person stage.

The pre-residential course directs learners to move through specific Petronia missions and prepare their answers to a series of academic prompts related to their insights before meeting in-person. Using Petronia in this way is helpful not only as a time-saving mechanism to build familiarity on common terminology and resource governance stages before in-person courses, but also to build shared experience for participants before an in-person event. This is particularly relevant when participants arrive from multiple stakeholder backgrounds such as civil society, private sector, government and media, with different levels of experience and understanding on the relevant topics. Petronia provides a shared foundation for all participants to enter the course on the same level.

Moving from the regional to the global level, Petronia has also featured in the classroom during a residential course, rather than before the course. The residential advanced course entitled 'Reversing the Resource Curse,' at the School of Public Policy at the Central European University used Petronia as an activity that students, in small groups, move through together before reconvening. Petronia is used in this

setting to add a deeper level to discussions on policy decisions and implications (in this case, informed by the groups' ratings from Mission 2's 'Risk Register'). 'Reversing the Resource Curse,' course convener Margarita Batlle notes:

'The simulation is great in the sense that it is very real... It does achieve what we want students to achieve in terms of putting them [in the situation] to make real life decisions with the information they have, and then reflect on why they chose what they chose. The participants were able to relate it to their country situation, but mostly [it was useful] to be able to understand how different approaches to different concepts and certain ideas had different consequences.'

As well as integrating into blended learning packages with online and in-person offerings, Petronia also features as part of a fully online learning package, in a MOOC run by the Colombia Center on Sustainable Investment, NRGi and the SDGAcademy, the online education platform of the Sustainable Development Solutions Network (SDSN), a global initiative for the United Nations. The course, hosted on edX, spans twelve weeks and builds student knowledge in multiple technical areas of resource governance through a package of expert lectures, readings, quizzes, discussion board activities and homework assignments.

One of the most challenging topics for students is revenue management. In recognition of the need for more tools to build student understanding of how to combine different stakeholder perspectives with the data analysis common in this area, Petronia (Mission 1 and 3) now features as the week's homework assignment. After students move through the designated missions, they must answer comprehension questions on the MOOC site, and share their revenue management policy choices via discussion board. Students are also invited to comment on the choices of others.

The high participation and number of comments recorded on the discussion board during this typically challenging week are testament to the impact of the simulation learning to reinforce the revenue management technical theory of the MOOC's lectures and readings, and to generate student interest in this topic. The nature of Petronia as an interactive, media-rich narrative, as opposed to a traditional didactic lecture, allowed students to contextualize information into a timeline and create a more practical framing of the knowledge they've been exposed to – and to enjoy it!

The MOOC students "love the missions – it stimulates thought and reinforces what's covered in the module ... kudos to the development team." Other great feedback from the MOOC students on the discussion board included:

'I love this because it has been able to create a context giving me a practical understanding of the precepts and concepts.'

'[It's not a] fictional scenario: it's in fact a real scenario because it corresponds to most African countries' cases. The multipartite approach provided is very interesting to understand and manage any extractive issues in wealth resource countries with poor economic growth.'

MOOC convener Tehtena Mebratu-Tsegaye notes, 'We integrated Petronia in order to introduce learners to this resource outside the platform, but also so that they were able to understand the competing considerations that policy makers have to weigh up when making these really important policy decisions about how to manage revenues. The reason why Petronia was such a useful tool for that was because of the

different actors with different perspectives that are represented in the different missions.’

The success of Petronia as a blended learning tool for target audiences, in addition to the positive feedback received by independent learners on the site itself, show that Petronia is meeting the content needs of the learners and filling the gap in interactive learning tools for resource governance around the world.

For further information on Petronia and our other projects, [visit our website](#).

4 Author

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