

Appendix 1

Game Objective	1. Explain the various components of the risk equation such as risk, hazard, vulnerability, and resilience.
Pre-Game Qs	How confident are you in your understanding of the concept of risk and its constituent components exposure, hazard, and vulnerability? (Circle one response) Not at all = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely = 5
Post-Game Qs	How confident are you in your understanding of the concept of risk and its constituent components exposure, hazard, and vulnerability? (Circle one response) Not at all = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely = 5
RESULTS of Surveys for UW	The average for Q.1 pre-survey was 2.42 and for post-survey was 3.14 with an average increase of 0.72 in respondents' confidence. 12% or 9/76 of respondents noted that they were not confident in the concepts of risk in the pre-game survey but after having played the flood resilience challenge game found that all respondents level of confidence increased by the time of completing the post-game survey. 64% or 9/76 respondents were moderately confident whereas 14% or 2/14 respondents were extremely confident with the concept of risk after having played the game and completing the post-game survey.
RESULTS of Surveys for Brock	The average for Q.1. pre survey was 3.54 and post survey was 3.50 with an average decrease of 0.04 in respondents' confidence after playing the game. 46% or 6/13 of respondents noted that they were moderately confident with the concepts of risk in the pre-game survey whereas 75% or 3/4 of respondents were moderately confident in the post-game survey.
Comparing UW and Brock results	An interesting finding is that initially Brock students felt more confident in understanding these concepts than UW students (2.42 versus 3.50 respectively) even though the assumption of the researchers was that it would be the opposite result. The post-game results indicate that UW students' confidence increased (by 0.72 to 3.14) and Brock students' confidence slightly decreased (by 0.04 to 3.50) which may indicate that Brock students who are not engineers realized from playing the game that they did not initially understand the concept of risk as well as they thought they did.
Game Objective	2. Describe different flood risk management measures.
Pre-Game Qs	How confident are you in your understanding of various flood risk management measures (e.g., dams, berms, buyouts, etc.)? (Circle one response) Not at all = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely = 5

The LITE Grants are funded by the Office of the Associate Vice-President, Academic (AVP-A). They are administered as a partnership between the Centre for Teaching Excellence and the Office of the AVP-A.

LITE Seed Grant Final Report

Post-Game Qs	How confident are you in your understanding of various flood risk management measures (e.g., dams, berms, buyouts, etc.)? (Circle one response) Not at all = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely = 5
RESULTS of Surveys for UW	The average for Q.2 pre-survey was 2.29 and for post-survey 3.00 with an increase of 0.71 in respondents' confidence. 16% or 12/76 of respondents noted that they were not confident in the FRM measures concepts in the pre-game survey but after playing the flood resilience challenge game found that only 7% or 1/14 respondents felt that they were not confident. In the post-game survey, 21% or 3/14 respondents were moderately confident whereas 43% or 6/14 respondents were extremely confident with the FRM measures concepts after having played the game and completing the post-game survey.
RESULTS of Surveys for Brock	The average for Q.2. pre-survey was 3.00 and for the post-survey was 3.50 with an increase of 0.50 in respondent's confidence. 15% or 2/13 of respondents noted that they were very confident in the FRM measures concepts in the pre-game survey whilst 50% or 2/4 of respondents were very confident in the concepts or risk after having played the game.
Comparing UW and Brock results	Again, an interesting finding that initially Brock students felt more confident in understanding flood risk management measures than UW students even though the assumption of the researchers was that it would be the opposite result. The confidence level of engineering students increased slightly more than non-engineering students indicating that they either learned more or realized they knew more than they initially thought.

Game Objective	3. Evaluate the benefits and challenges of each flood risk management measure (in a particular context).
Pre-Game Qs	Have you had prior experience with flood risk or flooding? If so, what type of flood (risk)? What was the level of severity? Where did you experience it? Comment:
Pre-Game Qs	What is your knowledge about real-world flooding issues? Very Low = 1 Below Average = 2 Average = 3 Above Average = 4 Very High = 5
RESULTS of Survey for UW	14% or 11/76 respondents have experienced flooding ranging from mild to severe. Types of flooding included rain/pluvial (43%), river (29%), lake (7%) and coastal (21%). Respondents noted experiencing floods in the Philippines, Hong Kong and the Don River in Toronto, Canada. The average knowledge level of flooding was a 2.50 with most respondents falling in the below average and average range.
RESULTS of Survey for Brock	15% or 2/13 respondents have experienced flooding ranging from mild to moderate. Types of flooding included rain (25%), river (50%), and coastal (25%). Respondents noted experiencing flooding in Vietnam. The average knowledge level of flooding was a 3.15 with most respondents falling in the average and above average range.

The LITE Grants are funded by the Office of the Associate Vice-President, Academic (AVP-A). They are administered as a partnership between the Centre for Teaching Excellence and the Office of the AVP-A.

LITE Seed Grant Final Report

Comparing UW and Brock results	Brock students reported having more experience with flooding than UW's engineering students. Both sets of students reported experiencing rain, river and coastal flooding in places like Canada, Vietnam and the Philippines with minimal knowledge about flooding.
Pre-Game Qs	How confident do you feel about your capacity to address real-world flooding issue? (Circle one response) Not at All = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely =5
Post-Game Qs	How confident do you feel about your capacity to address real-world flooding issue? (Circle one response) Not at All = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely =5
RESULTS of Survey for UW	On average, respondents were not at all to moderately (2.16) confident about their capacity to address flood risk issues in the pre-game survey. Respondents confidence increased for the post game survey with an average of 2.21 indicating a 0.05 increase after playing the game. One respondent was very confident in their ability to address flooding issues after having gone through the exercise. Common responses from participants included: <ul style="list-style-type: none"> • There is still more to learn and that the game alone is helpful but is insufficient to deal with the complexity of a real world experience • We have the knowledge and expertise to make valuable contributions to addressing real world flooding. However, as experienced in the game you can have all of these things and still make the wrong decision, and the implications of that are catastrophic and not easily undone. I'm not so sure I want to be the one responsible to bear the burden of making the wrong call.
RESULTS of Survey for Brock	On average, respondents were moderately (3.08) confident about their capacity to address flood risk issues in the pre-game survey. Respondents' confidence decreased for the post game survey with an average of 2.75 indicating a 0.33 decrease after playing the game. After playing the game, respondents found that FRM is a complex issue and needs consensus amongst multiple stakeholders. The average response in the post-game survey fell in the range of slightly to moderately.
Comparing UW and Brock results	In the pre-game survey Brock students were more confident (3.08 moderately confident) than UW students (2.16 which is slightly above moderately confident) in capacity to address real-world issues but after the game, the confidence of Brock students decreased (by 0.33) whereas UW students slightly increased (0.05). Brock students made comments such as the game helped them understand the complexity of the issues better which may have led to the realization that they were overconfident in their initial confidence.
Post-Game Qs	Did this exercise affect your understanding of flooding issues in the real world? How might you apply this understanding to your academic learning and/or professional work? Not at All = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely =5

The LITE Grants are funded by the Office of the Associate Vice-President, Academic (AVP-A). They are administered as a partnership between the Centre for Teaching Excellence and the Office of the AVP-A.

LITE Seed Grant Final Report

RESULTS of Survey for UW	The average response was a 2.93 with most responses falling in the range of slightly to very indicating an increased understanding of flood issues after playing the game. 36% or 5/14 respondents categorized their understanding level at slightly and another 29% or 4/14 respondents said that this exercise was very helpful in shaping their understanding of flooding issues.
RESULTS of Survey for Brock	The average response was a 3.00 with most responses falling in the range of slightly to very indicating an increased understanding of flood issues after playing the game. 25% or 1/4 of respondents categorized their understanding level at slightly and another 50% or 2/4 respondents said that this exercise increased their understanding of flood issues by a moderate level.
Comparing UW and Brock results	There was no significant difference between UW and Brock students on how their understanding of flooding issues in the real-world were affected by the game: 2.93 and 3.00 respectively with most responses falling in the range of slightly to very indicating an increased understanding of flood issues after playing the game. It is likely that students who engaged with more with the instructions and educational materials (handouts on flood risk measures, stakeholder roles, flood risk concepts, etc.) prior to the game felt their understanding increased more.
Post-Game Qs	Did this game help you with your overall understanding of flood risk governance (the ‘people’ component)? Not at All = 1 Slightly = 2 Moderately = 3 Very = 4 Extremely = 5
RESULTS of Survey for UW	The average response was a 3.43 with most responses falling in the range of slightly to extremely indicating an increased understanding of FRG after playing the game. 36% or 5/14 of respondents noted that their understanding can be categorized as ‘very’ whereas 14% or 2/14 of respondents noted that the game increased their understanding to a category of ‘extremely’.
RESULTS of Survey for Brock	The average response was 4.00 with most responses falling in the range of moderately to extremely indicating an increased understanding of FRG after playing the game. 25% or 2/4 of respondents noted that their understanding can be categorized as ‘moderately’ whereas 50% or 2/4 of respondents noted that the game increased their understanding to a category of ‘very’.
Comparing UW and Brock results	In summary, students in both small and large classrooms gained a better understanding of governance in terms of the political and power dynamics and the role of finances in decision-making. Participants noted that funding and resource capacity were key factors in decision making, reflecting the real-world.

Game Objective	4. Recognize the benefits and barriers of communication and collaborative decision-making in flood risk management.
FRG Evaluation Criteria	<ul style="list-style-type: none"> • promotes lesson-drawing and information-sharing (capacity to adapt) • coordinates efforts

The LITE Grants are funded by the Office of the Associate Vice-President, Academic (AVP-A). They are administered as a partnership between the Centre for Teaching Excellence and the Office of the AVP-A.

LITE Seed Grant Final Report

	<ul style="list-style-type: none"> encourages meaningful engagement with a range of stakeholders
Post - Game Qs	<p>Did this game help you with your overall understanding of communication and collaboration (benefits and barriers)?</p> <p>Comment:</p>
RESULTS of Survey for UW	<p>Common responses from participants included:</p> <ul style="list-style-type: none"> Improved understanding of the thought process of other stakeholders as everyone has their own agendas Understand the benefit of planning and collaborating with a diverse group of people to prevent natural disasters Communication is vital while bidding on flood management tools When floods occur, communication can easily break down despite even the best efforts
RESULTS of Survey for Brock	<p>Common responses from participants included:</p> <ul style="list-style-type: none"> Gained a better understanding of how people were involved in decision making in FRM Interests vary between different stakeholders and everybody has their own interests to protect, great way to get multiple perspectives taken into account when making important decisions. Good way to emphasize the barriers that exist in FRM such as; some parties needs are at the expense of others, time constraints, power dynamics (“loudest gets heard”). Lack of knowledge on flood mitigation methods can also lead to inadequate solutions being presented and subsequent poor decisions.
Comparing UW and Brock	<p>In summary, students from both classes gained a better understanding of the stakeholders involved, the importance of communication and the challenges of doing so, and how roles and responsibilities as well as interests and perspectives shapes how and what stakeholders communicate. An interesting comment provided by a Brock student emphasized that the “loudest gets heard” in these types of discussions.</p>
Debrief Qs	<ol style="list-style-type: none"> What are the benefits and challenges of collaboration? What kinds of collaborations are needed from the public, private and hybrid sectors to enhance flood resilience?
RESULTS Debrief for UW	<p>Common responses - did not ask this Question</p>
RESULTS Debrief for Brock	<ul style="list-style-type: none"> Common responses for Q1 in the debrief included: Complexity of collaboration Lots of cost sharing in round 2 between players, multiple mitigation measures implemented Participants suggested putting more “reduce vulnerability” measures As the mayor it's difficult to get votes as well, mayor thought she had to balance the needs of the community a little bit more Was a bit more difficult to get people on the same page (environmental vs. social impacts), little but more important to protect the people

The LITE Grants are funded by the Office of the Associate Vice-President, Academic (AVP-A). They are administered as a partnership between the Centre for Teaching Excellence and the Office of the AVP-A.

LITE Seed Grant Final Report

	<ul style="list-style-type: none"> • Enjoyed playing 2 roles, LD was more money incentivized, and FP has more resources, important to get government involved because they are a big player, big budgets • Politicians always have the highest sense of power, this game really showed that when people are given certain budgets they have to work with those constraints, politicians always have most money, governments are extremely powerful, stakeholders have a say but that it is interfered as well • many benefits of collaboration, lots of parties came together to discuss, overcome budget challenges when you have collaboration, you can fund certain things that you cannot fund on your own • If you don't want the same thing, there can be some challenges...priorities are different between stakeholders • Some people had trouble articulating in an online format and limited time, so hearing everyone's suggestion, people might have benefited from selfish choices rather than trying to listen to others and collaborate with others • Can exclude some people...push people into a decision faster • Complexity of collaboration • Pay a bit more attention to researchers and the knowledge that they have • Not really considering the bigger picture and the long term impacts, a lot of reliance
--	--

Game Objective	5. Identify stakeholder engagement techniques that facilitate dialogue and foster social learning.
Post-Game Qs	<p>Did this game help you with your overall understanding of governance (different levels of government and interactions/relationships between stakeholders)?</p> <p>Comment:</p>
RESULTS of Survey for UW	<p>Common responses from participants included:</p> <ul style="list-style-type: none"> • Improved understanding of how taxes work and what is included as part of taxes (e.g., awareness programs, warning systems) • Acknowledging that mayor and government workers are crucial in the decision-making process • General sentiments about distrust the government despite proactive actions taken by government authorities. "Government got richer, and the people got poorer" - UW participant
RESULTS of Survey for Brock	<p>Common responses from participants included:</p> <ul style="list-style-type: none"> • Governments are responsible for keeping the confidence of the people, while also making decisions for constituents when needed. Municipal governments have a better grasp on what the needs/wants of community members are as opposed to upper levels of government who might have more resources but are farther removed from the problem. Upper tier governments have access to resources that are highly valuable in decision making.

The LITE Grants are funded by the Office of the Associate Vice-President, Academic (AVP-A). They are administered as a partnership between the Centre for Teaching Excellence and the Office of the AVP-A.

LITE Seed Grant Final Report

	<ul style="list-style-type: none"> It would be beneficial to have rotating roles so all participants get to experience what it means to play a government role.
Comparing UW and Brock	In summary, students in both small and large classrooms gained a better understanding of governance in terms of the political and power dynamics and the role of finances in decision-making. Participants noted that funding and resource capacity were key factors in decision making, reflecting the real-world.
Post-Game Qs	Did this game help you with your overall understanding of power dynamics (between stakeholders)? Comment:
RESULTS of Survey for UW	Common responses from the participants included: <ul style="list-style-type: none"> Allowed for the understanding of how much say the government really has and how sometimes your position doesn't create a power dynamic but the way you communicate in the group and convince people does Stakeholders have their own power to implement rules and regulations in the sector that they work in Stakeholders who have the most money and therefore more buying power should be the ones funding FRM measures Stakeholders with more power can make decision without consulting stakeholders with less power
RESULTS of Survey for Brock	Common responses from the participants included: <ul style="list-style-type: none"> Competing stakeholder roles can be difficult to navigate. Key stakeholders (e.g., land developer, engineer, upper levels in the government) had the money and therefore had more power when it came to making FRM related decisions. It is important to understand how appointing people who have your interest in mind especially in government is vital for a cohesive community.
Comparing UW and Brock	In summary, both sets of students noted that the range of stakeholders allowed for a better understanding of power dynamics in the government and private industry, showcased competing interests and highlighted the role of communication as a key component in negotiations.
Debrief Qs	<ol style="list-style-type: none"> What were some of the trade-offs in the flood measures and values of stakeholders? How did this game affect your understanding of flood risk governance? How does your game experience compare with the article (Bogdan et al.) from your reading?
RESULTS Debrief	Did not ask these Qs because ran out of time

The LITE Grants are funded by the Office of the Associate Vice-President, Academic (AVP-A). They are administered as a partnership between the Centre for Teaching Excellence and the Office of the AVP-A.