Appendix B: Survey & Assessment Questions

Following are sample questions that we intend to use for our formative assessment.

Qn 1) What are the mandatory personal protective equipment (PPE) one needs to use while operating a pump?

<table>
<thead>
<tr>
<th>Bump hat</th>
<th>Eye shield</th>
<th>Safety shoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wellington Boots</td>
<td>Gas mask</td>
<td>Face shield</td>
</tr>
<tr>
<td>Life Jacket</td>
<td>Safety Harness</td>
<td>Safety gloves</td>
</tr>
</tbody>
</table>

Qn 2) What are the key internal parts of an industrial centrifugal pump? Check all that applies

a) Impeller  
b) Casing  
c) Suction pipe  
d) Delivery pipe  
e) Motor  
f) Valve
Qn 3) Following are the steps involved in safe start-up of an industrial pump. List them in the correct order of execution.

a) Open tank valve and common discharge valve fully
b) Slowly open pump suction
c) Open around 20 to 30% discharge valve
d) Request DCS switch ON using tablet
e) Open 10 – 20% pump suction for selected pump
f) Slowly open up to 20% pump discharge valve
g) Fully close the discharge vent
h) Fully open pump discharge valve
i) Put motor switch to Auto on control panel
j) Shutdown pump or troubleshoot pump if an error occurs

Qn 4) What would be your first response when a pump stops working? (provide list of actions)

Qn 5) In the event that the pump has a problem, but you have no idea what is the issue, what would be your first corrective action?

Qn 6) What are some of the notable things you have learnt in VR environment?

Qn 7) How would you rate the VR experience (on the scale of 1 to 5, 5 being extremely positive, 1 being extremely negative)? What were the main aspects of the VR experience that determined your rating?

Qn 8) How well did the VR experience stimulate your curiosity about the pump?

Qn 9) What would be one thing you wish to see or have in the next version of the VR experience?

Qn 10) If given the choice, would you choose the VR activity, traditional chemical engineering problem sets as homework, or traditional lecture for CN2122A? (Assume all other variables remain unchanged)

Qn 11) Which method do you think helps you remember better, watching someone else use the VR model or you using the VR model yourself? Which sequence would help you learn better? Doing guided mode multiple times then trying assessment mode, or cycle between these 2 modes?

Qn 12) When it comes to starting up the pump, what are some differences between watching someone use the VR model versus you using it yourself?

Qn 13) If there is anything in particular that you would like to share about your experience with the VR models, please let us know.