

Table 5- Supplementary Material- Quantitative results

Survey Instrument- Student Version

An exploration of student and facilitator perspectives of problem-based learning (PBL) online.

The survey should take you approximately 10 minutes to complete. Given your familiarity with F2F PBL, you are uniquely placed to reflect on you online experiences.

Thank you for taking the time to participate.

Participation eligibility

I am

2nd year Speech and Language Therapy Student (55.3%)

3rd year Speech and Language Therapy Student (44.7%)

Please state your age: ____

Experience of Online Video Communication

1. Would you consider yourself technologically competent?

Yes (93.6%) No (6.4%)

2. How often did you use online video communication (e.g., Zoom, Facetime, Snapchat) **outside of the educational setting before** starting PBL online at NAMED UNIVERSITY?

Daily 0-1 hours-17.20%

Few times a week- 24.40%

Daily 2-3 hours-25.53%

Fortnightly- 4.25%

Daily 4-5 hours-8.51%

Monthly-6.38%

Daily 5+ hours-4.25%

No experience-4.25%

Once a week-6.38%

3. **Within the educational setting**, please indicate time spent on online video communication **before** starting PBL online at NAMED UNIVERSITY?

- Daily 0-1 hours-14.89%
- Daily 2-3 hours- 2.1%
- Daily 4-5 hours 2.1%
- Daily 5 + hours- 2.1%
- Once a week- 6.38%
- Few times a week- 6.38%
- Fortnightly- 6.38%
- Monthly- 8.51%
- No experience- 51%

4. How many tutorials of online PBL have you experienced at NAMED UNIVERSITY?
Based on experience between October 2020 to February 2021.

Evaluation of Microsoft Teams

These questions will ask you to evaluate your experience of Microsoft Teams as an online video-conferencing platform, and suitability for the delivery of PBL online. You will now be asked to rate the following statements with 1 =strongly disagree and 5 =strongly agree.

5. Microsoft Teams is easy to use

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
0%	2.1%	12.8%	59.6%	25.5%

6. Microsoft Teams is a suitable platform to conduct PBL online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
0%	2.1%	14.9%	44.7%	38.3%

7. Please rate the following features of Microsoft Teams in order of important with 1 =least important and 5 =most important.

	Least important	Somewhat Important	Neutral	Very important	Most important
Chat based function	0%	23.4%	21.27%	48.93%	6.38%
Hand raising tool	21.27%	21.27%	27.65%	29.78%	0%
Screenshare	0%	2.12%	2.12%	38.29%	57.44%
Security	4.25%	12.76%	27.65%	34%	21.27%
Create class folders	2.12%	10.63%	31.91%	36.17%	19.14%
Collaborate live in real time.	0%	0%	6.38%	25.53%	68%

8. Does the platform functionality of Microsoft Teams support your ability to learn and interact online?

Yes-93.6% No-6.6%

9. Please list two comments you have about the use of Microsoft Teams as a platform for delivering PBL online.

Collaborative Learning

These questions will ask you about the group learning process online. Please rate the following statements with 1=strongly disagree and 5=strongly agree.

10. Compared to F2F collaborative PBL learning, I believe PBL online leads to:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
More difficulty interpreting non-verbal communication	2.12%	6.38%	4.25%	36.17%	51.06%
More difficulty establishing group dynamics	2.12%	4.26%	6.38%	38.30%	48.94%
More comfort expressing my views	10.63%	40.43%	23.40%	17.02%	8.51%
Enhanced flow of conversation during discussion	36.17%	40.43%	12.77%	6.38%	4.26%
An increase in uneven contributions from students	2.13%	12.77%	23.40%	29.79%	31.91%
Lack of spontaneous interactions	6.38%	8.51%	6.38%	36.17%	42.55%

11. Do you think group collaboration during online PBL differed from F2F PBL?

Yes (91.5%) No (8.5%)

12. Please explain your answer to Q 11.

Quality of Individual Learning

The questions will ask you about the quality of your individual learning during PBL online.

Please rate the following statements, with 1 =strongly disagree and 5 =strongly agree.

13. I take a less active role in the PBL process online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
19.1%	38.3%	21.3%	12.8%	8.5%

14. I believe the depth of discussion online is an effective as F2F PBL.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
31.9%	29.8%	12.8%	14.9%	10.6%

15. PBL online enhance my ability to deeply process content (e.g., better acquisition and understanding of knowledge)

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
21.3%	34%	29.8%	10.6%	4.3%

16. I take more responsibility for self-directed learning online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
8.5%	21.3%	21.3%	31.9%	17%

17. I think the quality of learning outcomes during PBL online is equal to F2F PBL learning outcomes.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
25.5%	19.1%	21.3%	27.7%	6.4%

18. It is more challenging for me to integrate knowledge from online PBL and online supplemental lectures and workshops (e.g., Anatomy, Speech and Hearing Sciences, Research Methods)

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
8.5%	29.8%	12.8%	17%	31.9%

19. Do you think the quality of individual learning during PBL online differed from F2F PBL?

Yes (70.2%) No (29.8%)

20. Please explain your answer to Q 19.

Role of the Facilitator

These questions will ask you about the role of the facilitator during PBL online. Please rate the following statements with 1 =strongly disagree and 5 =strongly agree.

21. During PBL online I think the facilitator...

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Communicates expectations for student participation	10.64%	14.90%	17.02%	46.80%	10.64%

Has a greater role in managing group dynamics	10.64%	29.79%	19.15%	31.91%	8.51%
Has to intervene more often during group processes	10.64%	27.66%	17.02%	40.43%	4.26%
Is consulted more often in relation to content knowledge	17.02%	38.30%	14.90%	21.28%	8.51%
Provides satisfactory feedback about group participation	8.51%	23.40%	10.63%	36.17%	21.28%

22. Do you think the tutor role in PBL online differed from F2F PBL?

Yes (59.6%)

No (40.4%)

23. Please explain your answer to Q 22.

Perspectives of the PBL Environment Online

Given your familiarity the F2FPBL, you are uniquely placed to reflect on your online experiences. These questions will ask you your opinion of the PBL environment online.

24. What of the below options do you perceive are advantages of PBL online? **(Tick all applicable)**

- | | |
|---|--|
| <input type="checkbox"/> No travel (95.7%) | <input type="checkbox"/> Flexibility (ability to partake from any place) (66%) |
| <input type="checkbox"/> Participate off-campus (42.6%) | <input type="checkbox"/> More relaxed environment (25.5%) |
| <input type="checkbox"/> Time efficient (59.6%) | <input type="checkbox"/> Reduction in indirect costs (e.g., transport and parking) (70.2%) |
| <input type="checkbox"/> Suited my approach to learning (14.9%) | <input type="checkbox"/> Increased study time (34%) |

25. Which of the below options do you perceive are barriers of PBL online? **(Tick all applicable)**

- | | |
|---|---|
| <input type="checkbox"/> Internet connectivity (poor audio/ visual quality) (93.6%) | <input type="checkbox"/> Lack of devices (38.3%) |
| <input type="checkbox"/> Environmental distractions (72.3%) | <input type="checkbox"/> Lack of motivation (78.7%) |
| <input type="checkbox"/> Lack of space (44.7%) | <input type="checkbox"/> Difficulty concentrating (70.2%) |
| <input type="checkbox"/> Social isolation (72.3%) | <input type="checkbox"/> Other |

You will now be asked to rate the following statements about your PBL experience online with 1 =strongly disagree and 5 =strongly agree.

26. I feel online PBL is as effective as F2F PBL.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
29.8%	31.9%	6.4%	23.4%	8.5%

27. I prefer online PBL to F2F PBL.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
44.7%	14.9%	21.3%	8.5%	10.6%

28. My internet connection can be problematic.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
6.4%	4.3%	10.6%	42.6%	36.2%

29. I enjoy PBL online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
10.6%	25.5%	27.7%	21.3%	14.9%

30. Please explain your answer to Q29

Overall Perspectives

Given your familiarity with F2F PBL, you are uniquely positioned to reflect on your online experiences. These questions will ask your overall opinion of PBL online.

31. What do you feel are the barriers to PBL online?

32. What are your positive experiences of PBL online?

33. How would you change PBL online if you had the opportunity to do so? Why do you think this would be more effective?

34. What aspects of the PBL process online would you keep the same?

35. What advice would you give a student starting PBL online for the first time?

36. What format do you prefer?

Online PBL (23.4%) F2F PBL (76.6%)

37. Please indicate your preference with regard to future use of online PBL

More 19.1%

Less 21.3%

None 36.2%

No preference 23.4%

38. The COVID-19 pandemic has undoubtedly impacted delivery of PBL at NAMED UNIVERSITY. Please describe your perception of these changes.

Do you have any further comments?

Survey Instrument- Facilitator Version

An exploration of student and facilitator perspectives of problem-based learning (PBL) online.

The survey should take you approximately 10 minutes to complete. Given your familiarity with F2F PBL, you are uniquely placed to reflect on you online experiences.

Thank you for taking the time to participate.

Participation eligibility

I am

2nd year Speech and Language Therapy Facilitator (60%)

3rd year Speech and Language Therapy Facilitator (40%)

Please state your age: ____

1. Experience of Online Video Communication

1. Would you consider yourself technologically competent?

Yes (100%) No

2. How often did you use online video communication (e.g., Zoom, Facetime, Snapchat) **outside of the educational setting before** starting PBL online at NAMED UNIVERSITY?

Daily 0-1 hours (20%)

Few times a week (40%)

Daily 2-3 hours

Fortnightly (20%)

Daily 4-5 hours

Monthly

Daily 5+ hours

No experience

Once a week (20%)

3. **Within the educational setting**, please indicate time spent on online video communication **before** starting PBL online at NAMED UNIVERSITY?

- Daily 0-1 hours
- Daily 2-3 hours
- Daily 4-5 hours
- Daily 5+ hours
- Once a week
- Few times a week (20%)
- Fortnightly
- Monthly
- No experience (80%)

4. How many tutorials of online PBL have you facilitated at NAMED UNIVERSITY? October 2020 to February 2021.

Evaluation of Microsoft Teams

These questions will ask you to evaluate your experience of Microsoft Teams as an online video-conferencing platform, and suitability for the delivery of PBL online. You will now be asked to rate the following statements with 1 = strongly disagree and 5 = strongly agree.

5. Microsoft Teams is easy to use

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
20%	0%	40%	20%	20%

6. Microsoft Teams is a suitable platform to conduct PBL online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
0%	0%	40%	60%	0%

7. Please rate the following features of Microsoft Teams in terms of importance with 1 = least important and 5 = most important.

	Least important	Somewhat Important	Neutral	Very important	Most important
Chat based function	0%	20%	0%	60%	20%
Hand raising tool	20%	20%	40%	20%	0%
Screenshare	0%	20%	20%	40%	20%
Security	0%	0%	20%	40%	40%
Create class folders	20%	40%	20%	20%	0%
Collaborate live in real time.	0%	0%	0%	0%	100%

8. Does the platform functionality of Microsoft Teams support your ability to learn and interact online?

Yes (100%) No

9. Please list two comments you have about the use of Microsoft Teams as a platform for delivering PBL online.

Collaborative Learning

These questions will ask you about the student group learning process online. Please rate the following statements with 1 =strongly disagree and 5 =strongly agree.

10. Compared to F2F collaborative PBL learning, I believe PBL online leads to:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
More difficulty interpreting non-verbal communication	0%	0%	0%	40%	60%
More difficulty establishing group dynamics	0%	0%	0%	0%	100%
More comfort expressing my views	0%	80%	20%	0%	0%
Enhanced flow of conversation during discussion	60%	20%	0%	0%	20%
An increase in uneven contributions from students	0%	0%	20%	60%	20%
Lack of spontaneous interactions	0%	0%	0%	40%	60%

11. Do you think group collaboration during online PBL differed from F2F PBL?

Yes (100%) No

12. Please explain your answer to Q 11.

Quality of Individual Learning

The questions will ask you to evaluate the quality of your individual student learning during PBL online. Please rate the following statements, with 1 =strongly disagree and 5 =strongly agree.

13. Students take a less active role in the PBL process online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
0	40%	0%	60%	0%

14. I believe the depth of discussion online is an effective as F2F PBL.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
20%	60%	0%	20%	0%

15. PBL online enhanced students' ability to deeply process content (e.g., better acquisition and understanding of knowledge)

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
20%	40%	40%	0%	0%

16. Students take more responsibility for self-directed learning online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
0%	0%	100%	0%	0%

17. I think the quality of learning outcomes during PBL online is equal to F2F PBL learning outcomes.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
20%	40%	20%	20%	0%

18. It is more challenging for students to integrate knowledge from online PBL and online supplemental lectures and workshops (e.g., Anatomy, Speech and Hearing Sciences, Research Methods)

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
0%	20%	60%	20%	0%

19. Do you think the quality of individual student learning during PBL online differed from F2F PBL?

Yes (60%)

No (40%)

20. Please explain your answer to Q 19.

Role of the Facilitator

These questions will ask you about your role as facilitator during PBL online. Please rate the following statements with 1 =strongly disagree and 5 =strongly agree.

21. During PBL online I...

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Communicate expectations for student participation	0%	0%	20%	80%	0%
Have a greater role in managing group dynamics	0%	0%	40%	0%	60%
Ask more question to guide group learning.	0%	0%	0%	80%	20%
Is consulted more often in relation to content knowledge	0%	20%	40%	20%	20%
Provides satisfactory feedback about group participation	0%	0%	0%	0%	100%

22. Do you undertake additional preparation to facilitate PBL online?

- Yes (80%) No (20%)

23. Do you have to undertake the additional role of technical support during PBL online?

- Yes (60%) No (40%)

24. Do you think the tutor role in PBL online differed from F2F PBL?

- Yes (60%) No (40%)

25. Please explain your answer to Q 24.

Perspectives of the PBL Environment Online

Given your familiarity the F2FPBL, you are uniquely placed to reflect on your online experiences. These questions will ask you your opinion of the PBL environment online.

26. What of the below options do you perceive are advantages of PBL online?(Tick all applicable)

- | | |
|--|--|
| <input type="checkbox"/> No travel (80%) | <input type="checkbox"/> Flexibility (ability to partake from any place) (80%) |
| <input type="checkbox"/> Participate off-campus (60%) | <input type="checkbox"/> More relaxed environment (0%) |
| <input type="checkbox"/> Time efficient (60%) | <input type="checkbox"/> Reduction in indirect costs (e.g., transport and parking) (80%) |
| <input type="checkbox"/> Increased tutorial preparation time (20%) | <input type="checkbox"/> Other |

27. Which of the below options do you perceive are barriers of PBL online? **(Tick all applicable)**

- | | |
|--|---|
| <input type="checkbox"/> Internet connectivity (poor audio/ visual quality) (100%) | <input type="checkbox"/> Lack of devices (100%) |
| <input type="checkbox"/> Environmental distractions (40%) | <input type="checkbox"/> Lack of motivation (60%) |
| <input type="checkbox"/> Lack of space (40%) | <input type="checkbox"/> Difficulty concentrating (60%) |
| <input type="checkbox"/> Social isolation (80%) | <input type="checkbox"/> Other |

You will now be asked to rate the following statements about your PBL experience online with 1 =strongly disagree and 5 =strongly agree.

28. I feel online PBL is an effective as F2FPBL.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
20%	40%	20%	20%	0%

29. I prefer online PBL to F2F PBL

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
80%	20%	0%	0%	0%

30. My internet connection can be problematic.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
20%	0%	60%	20%	0%

31. I enjoy PBL online.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
0%	40%	40%	20%	0%

32. Please explain your answer to Q31

Overall Perspectives

Given your familiarity with F2FPBL, you are uniquely positioned to reflect on your online experiences. These questions will ask your overall opinion of PBL online.

33. What do you feel are the barriers to PBL online?

34. What are your positive experiences of PBL online?

35. How would you change PBL online if you had the opportunity to do so? Why do you think this would be more effective?

36. What aspects of the PBL process online would you keep the same?

37. What advice would you give a student starting PBL online for the first time?

38. What format do you prefer?

Online PBL

F2F PBL (100%)

39. Please indicate your preference with regard to future use of online PBL

More (0%)

Less (80%)

None (20%)

No preference (0%)

40. The COVID-19 pandemic has undoubtedly impacted delivery of PBL at NAMED UNIVERISTY. Please describe your perception of these changes.

Do you have any further comments?