

*"[Students] are recipients of the actions of others,
not active agents in the assessment process.
Such conceptions of assessment are inappropriate for long-term learning
and they also limit current learning."*

- David Boud and Nancy Falchikov (2007)

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A Move to Sustainability

In 2009 a survey was commissioned by the Association of American Colleges and Universities (AAC&U) where it found that "71% of employers indicated the importance of 'teamwork skills and the ability to collaborate with others in diverse group settings'; where it stimulated the design of a sustainable and continuously-improving means of assessing the development of teamwork skills within an individual [Hart Research Associates 2010 in "Evaluating Teamwork" Queen's University].

That same year, Palmer Pol *et al.* (2009) reported the results of a comparative study of the opinions of academia and employers on general competencies (*i.e.* 'soft skills') in Higher Education. They noted that:

"Respecto a la importancia de las competencias genéricas ambos colectivos reconocen la importancia de la formación en competencias, especialmente los empleadores." (p.437)
"Both groups, particularly employers, recognised the importance of the development of soft skills" [Translation LY]

Furthermore:

“Respecto a las diferencias entre ambos grupos, los académicos eligen básicamente competencias relacionadas con el proceso de aprendizaje como el Pensamiento analítico, la Capacidad para encontrar nuevas ideas y soluciones y las Habilidades de investigación. Por su parte, los empleadores eligen competencias mayoritariamente metodológicas (saber hacer) relacionadas con la práctica profesional como la Capacidad de utilizar herramientas informáticas, la Capacidad de utilizar el tiempo de forma efectiva y la Capacidad para redactar informes o documentos.” (p.437-8)

which, García, M.G., *et al.* (2016) translate and summarise as:

“...while academics focus on those competencies related to the learning process (analysis, problem solving, research), employers focus on capacities related to autonomy, the efficient use of time, document writing and the use of technology.”

noting that “even when soft skills are essential to achieve efficient work, universities still tend to overlook them”.

The team for the strategic direction of education at SUMS, comprising the Associate Dean for Education, Director of Postgraduate Education, and Director of Undergraduate Education, has expressed a desire to revise of our current Summative Peer Evaluation component to a sustainable Formative Peer Assessment component; and this proposal is presented in response as a scoping document drawing upon some of the most recent literature available.

As the key terms: ‘summative’, ‘formative’, ‘evaluation’ and ‘assessment’ receive different definitions in the literature surveyed, for the interests of meaningful discussion, the following definitions have been employed:

Summative activity occurs at the end of an educational activity and is used to judge a learner’s performance; the outcome is used to determine readiness for progression, or result in a grade which is used to communicate students’ abilities to external stakeholders. (Adapted from Yambi, 2018)

Formative activity is designed to assist the learning process by providing feedback to the learner, which can be used to identify strengths and weaknesses and hence improve future performance. (Adapted from Yambi, 2018)

Assessment aims to enable learners to adjust their approach or study habits so that they can enhance their learning. Assessment is a diagnostic tool focused on the learning of individual students. (Learning+Teaching Lab MIT, 2022)

Evaluation is a process that uses a variety of quantitative or qualitative techniques to analyse program, pedagogical, or course outcomes to determine whether they have been met. (Learning+Teaching Lab MIT, 2022)

“...the key difference between the two is that assessment is directed toward learning progression, evaluation is aimed to outcome.”

Conventional Benefits and Challenges

Adachi, C., *et al.* (2017) investigated the perceived advantages and disadvantages of self and peer assessment from the Academics' perspective. These have been considered as part of this revision for the management of cultural change, and the points are summarised below.

Benefits, opportunities and affordances for self and peer assessment

- **Development of soft/transferable skills**
evaluative judgement, communication, reflective/critical thinking
- **Authentic assessment**
cultivating students who are work-ready, life-long learners, becoming independent learners
- **Promoting active learning**
students as assessors, learning from others, teamwork
- **Better understanding of standards and assessment criteria**
- **Timely, varied and appropriate feedback for students**
- **Communication Skills**
involved in giving and receiving feedback
- **Less input (and time) required of teachers**

Challenges and inhibitors of self and peer assessment

- **Reliability and accuracy of students' judgement skills**
- **Superficial learning**
Low engagement with the assessment
- **Feedback skills**
non-completion of feedback loops, feedback literacy and academic integrity
- **Perceived expertise**
Students might consider themselves as novices
- **Power relations**
Disruption of the student-teacher boundary
- **Students' and academics' motivation**
- **Time and resource constraint**

Revising Peer Assessment for Sustainability

Boud and Falchikov (2007) proposed that the following points be taken into account (emphasis mine):

1. The importance of a **standards-based framework** to enable students to view their own work in the light of acceptable practice;
2. A **belief by teachers** that all students can succeed;
3. The need to foster **confidence about students' capacity** as learners because their beliefs about this affect achievement;
4. The need to **consider separating comments from grades** because grades distract from engaging with feedback;
5. The need to **focus assessment on learning** rather than performance;
6. The vital role of the development of **self-assessment abilities**;
7. Encouragement of **reflective assessment with peers**; and,
8. Ensuring that comments on assessment tasks are **actually used to influence further learning**

when revising assessment practices in order to achieve a sustainable outcome.

Dimensions of the Assessment

Consequently in terms of implementation, the assessment should:

- **Be Meaningful to Student Learners**
The potential for beneficial development of key skills *e.g.* teamwork and employability must be obvious
- **Be Meaningful to Academic Learners**
Effectiveness of group assessment, rich data, module specific
- **Be Concise, Succinct, and Brief**
Keeping the threshold of engagement (*i.e.* effort requirement) as low as possible
- **Be Simple to Deploy**
Keeping the administrative burden on staff as low as possible
- **Comprise Multiple Sampling Points**
This is essential so that the trajectory of learning can be ascertained, and provide opportunities for constructive intervention
- **Be Flexible/Expandable**
Structured to comprise a core of periodically-reviewed questions, and further accommodate custom questions for module-specificity and obtain rich data
- **Be Scalable**
Can be deployed and administered across a broad range of cohort sizes

- **Yield Comparable Information**

Intra-module, Inter-module, Programme level, Data processable for assurance of learning

Specimen Questions

The meaningfulness of the assessment - to student and academic learners alike - as manifested in the questions asked, determines the level of engagement and quality of response. To this end, a number of possible peer evaluations have been surveyed, and three banks of sample questions have been included as potential starting points.

Bank One - Buddycheck's Built-in Questions

The question formats demonstrate Buddycheck's features in assessing whole-group activity as well as comparative intra-group activity. The change in likert scale set between that of agreement to frequency may catch out the unwary. There is a significant section on conflict, which may place undue focus on it in the group.

Bank Two - Peer Assessment in the Development of Employability Skills

Edited from: Stewart, K. (2014).

The assessment asks questions about the comparative performance of individuals in the group, and does not address the performance of the group as an entirety.

The questions read as if they have been written to obtain as objective a response as possible, possibly for the sake of data collection, resulting in a mechanistic tone. Only one likert scale set: performance, non-standard, was deployed.

Bank Three - Formative Self and Peer Assessment for Improved Student Learning

Adapted from: Wanner, T., & Palmer, E. (2018).

This survey of students about the satisfaction and usefulness of self and peer assessment yields quantitative information garnered from responses on different Likert scale sets (agreement, satisfaction, engagement). As a survey of peer assessment, it provides valuable insight into how a peer assessment might be structured.

Bank One - BuddyCheck's Built-in Questions

Set One: Team Satisfaction (Three Questions)

Likert Scale:

1. Strongly Disagree | 2. Disagree | 3. Neither Agree Nor Disagree | 4. Agree | 5. Strongly Agree

I am satisfied with my present teammates.

I am pleased with the way my teammates and I work together.

I am very satisfied with working in this team.

Set Two: Team Conflict (Nine Questions)

Likert Scale:

1. None or Not at all | 2. Little or Rarely | 3. Some | 4. Much or Often | 5. Very Much or Very Often

How much conflict of ideas is there in your work group?

How much emotional conflict is there in your work group?

How much relationship tension is there in your work group?

How often do people get angry while working in your group?

How much conflict is there in your group about task responsibilities?

How often are there disagreements about who should do what in your work group?

How often do you disagree about resource allocation in your work group?

How frequently do you have disagreements within your work group about the task of the project you are working on?

How often do people in your work group have conflicting opinions about the project you are working on?

Set Three: Keeping the team on track (One Question x No. of Group Members)

Likert Scale (evaluating self and others i.e. You, Student 1, Student 2, etc), end and mid-scale reference points.

5 Watches conditions affecting the team and monitors the team's progress. Makes sure that teammates are making appropriate progress. Gives teammates specific, timely, and constructive feedback.

4 (no text)

3 Notices changes that influence the team's success. Knows what everyone on the team should be doing and notices problems. Alerts teammates or suggests solutions when the team's success is threatened.

2 (no text)

1 Is unaware of whether the team is meeting its goals. Does not pay attention to teammates' progress. Avoids discussing team problems, even when they are obvious.

Set Four: Interacting with teammates (One Question x No. of Group Members)

Likert Scale (evaluating self and others i.e. You, Student 1, Student 2, etc), end and mid-scale reference points.

5 Asks for and shows an interest in teammates' ideas and contributions. Makes sure teammates stay informed and understand each other. Asks teammates for feedback and uses their suggestions to improve.

4 (no text)

3 Listens to teammates and respects their contributions. Communicates clearly. Shares information with teammates. Respects and responds to feedback from teammates.

2 (no text)

1 Interrupts, ignores, bosses, or makes fun of teammates. Takes actions that affect teammates without their input. Doesn't share information. Is defensive. Will not accept help or advice from teammates.

Set Five: Having related knowledge, skills and abilities (One Question x No. of Group Members)

Likert Scale (evaluating self and others i.e. You, Student 1, Student 2, etc), end and mid-scale reference points.

5 Demonstrates the knowledge, skills, and abilities to do excellent work. Acquires new knowledge or skills to improve the team's performance. Able to perform the role of any team member if necessary.

4 (no text)

3 Demonstrates sufficient knowledge, skills, and abilities to contribute to the team's work. Acquires knowledge or skills as needed to meet requirements. Able to perform some of the tasks normally done by other team members.

2 (no text)

1 Missing basic qualifications needed to be a member of the team. Unable or unwilling to develop knowledge or skills to contribute to the team. Unable to perform any of the duties of other team members

Set Six: Expected quality (One Question x No. of Group Members)

Likert Scale (evaluating self and others i.e. You, Student 1, Student 2, etc), end and mid-scale reference points.

5 Motivates the team to do excellent work. Cares that the team does outstanding work, even if there is no additional reward. Believes that the team can do excellent work.

4 (no text)

3 Encourages the team to do good work that meets all requirements. Wants the team to perform well enough to earn all available rewards. Believes that the team can fully meet its responsibilities.

2 (no text)

1 Satisfied even if the team does not meet assigned standards. Wants the team to avoid work, even if it hurts the team. Doubts that the team can meet its requirements.

Set Seven: Contributing to the team's work (One Question x No. of Group Members)

Likert Scale (evaluating self and others i.e. You, Student 1, Student 2, etc), end and mid-scale reference points.

5 Does more or higher-quality work than expected. Makes important contributions that improve the team's work. Helps teammates, also concerning difficult tasks.

4 (no text)

3 Completes a fair share of the team's work with acceptable quality. Keeps commitments and completes assignments on time. Helps teammates who are having difficulty when it is easy or important.

2 (no text)

1 Does not do a fair share of the team's work. Delivers sloppy or incomplete work. Misses deadlines. Is late, unprepared, or absent for team meetings. Does not assist teammates. Quits if the work becomes difficult.

Bank Two - Peer Assessment in the Development of Employability Skills

Likert Rating Scale:

- 5 Outstanding: performed consistently and reliably from start to finish.
- 4 Above Average: performed well the majority of the time, very reliable team member
- 3 Average: did what was required in order to complete the task
- 2 Below Average: did not perform consistently, required a lot of supervision and support
- 1 Poor: performance was well below the standard required, could not be relied upon

Note: Ratings of '2' or '1' must be supported by comments on the form.

Group Member	You	Member 1	Member 2
Attendance:	1-5		
Attended meetings consistently			
Came prepared and contributed to the meetings			
Focused on work during the meetings			
Communication:	1-5		
Initiated and responded to communication in a reasonable amount of time (24-hour)			
by Email, discussion posts, texts (if applicable)			
Communication was respectful			
Listened to other committee members			
Work Contribution:	1-5		
Contributed equally and reliably to all aspects of the group's tasks and responsibilities			
Contribution was of strong quality and within deadlines			
Teamwork:	1-5		
Demonstrated positive teamwork skills including professionalism, commitment, support, respect, reliability			
Supportive of other group members			
Actively offered input and ideas/suggestions			
Had a positive attitude and managed stress professionally			

Personal Responsibility/Accountability:

1-5

Demonstrated personal responsibility

Followed up if absent, notified group members in advance of absences

Demonstrated initiative by offering to take on tasks rather than waiting to be told.

Total of all ratings out of 25 marks

5-25

Positive Comment

[Click here to enter text.](#)

Constructive Comment

[Click here to enter text](#)

Bank Three - Formative Self and Peer Assessment for Improved Student Learning

Likert Scale: results expressed as median [interquartile range], 1 = strongly agree, 5 = strongly disagree, 3 = no opinion/neutral.

Presented below in the format:

Question (Result: Median [Interquartile range])

Pre-assessment

The practice session on self and peer-assessment was helpful	2 [2–3]
I understood the assessment criteria used for self and peer-assessment	2 [2–2]
10% was an appropriate percentage for the self and peer-assessment exercise	2 [2–3]

Self-assessment

It was a valuable part of assessing my own learning	2 [2–3]
It helped me to improve my work	2 [1–3]
It was a good use of my time	2.5 [2–4]
It should be part of most courses	3 [2–4]
I was confident in marking my own work	2 [2–3.25]
I modified my work based on the self-assessment	2 [2–3]

Please provide the amount of time you spent doing the self-assessment (in minutes)

2 [2–3]
(16–30 min)

Please rate your overall satisfaction level doing the self-assessment in this course

(1 = very satisfied, 10 = very dissatisfied)

5 [3–7]

Peer-assessment

It was a valuable part of assessing my own learning	2 [2–3]
It helped me to improve my work	2 [1–3]
It was a good use of my time	2 [1.75–4]
It should be part of most courses	3 [2–4]
I was confident in marking other people's work	2 [2–4]
Peer-assessment should always be anonymous	1 [1–2]
The student peer reviewer should give a mark along with feedback	2.5 [2–4]
I learned a lot from giving feedback to my peers	2 [2–3.25]
I learned a lot from receiving feedback from my peers	2 [2–4]
I modified my work based on the feedback provided to me by my peers	2 [1–3]

Please provide the amount of time you spent doing the peer-assessment (in minutes)

4 [2–4]
(46–60 min)

Please rate your overall satisfaction level doing the peer-assessment in this course
(1 = very satisfied, 10= very dissatisfied).

4 [2–7.75]

Please rate your honest contribution to the peer-assessment process i.e:

1=highly engaged (provided extensive feedback and made use of the provided feedback)

2=engaged (provided moderate feedback and made use of provided feedback)

3=basically engaged (provided brief feedback and read provided feedback)

2 [1–2.5]

Body of the Peer Assessment

Based on a survey of the specimen question banks and our colleagues' prior comments, we can anticipate that the peer assessment template will encompass these themes:

Group Dynamics (core)

Developed from Boss, J. (2018) and Fellow (2020).

Individual reflection on the entire group on satisfaction, performance, and conflict management.

Individual Accountability (core)

Developed from Dagher, K. (2020).

Comparative reflections on every member's individual contributions, responsibility, and accountability.

Teamwork Abilities (core)

Comparative reflections on every member's individual ability to motivate, collaborate, and lead.

Free-text Questions (optional)

To provide learners with an opportunity to provide qualitative feedback in their own words.

Module-specific aspects of Group-work (optional)

To provide module leaders with an opportunity to obtain information specific to group-work in their module.

Sets and Questions of the SUMS Template

These are the key features of the proposed question sets:

1. The assessment body is designed to be as **brief** as possible, to maximise engagement and minimise fatigue as it is designed to be deployed more than once per module.
2. The questions are grouped by **theme**. This renders the assessment navigable, and makes the meaningfulness of the questions clear.
3. A **single** Likert scale set has been used (agreement) to maintain cognitive coherence during the sampling.
4. At least **two** peer questions in Buddycheck need to be present for the algorithm to detect whether members of a group are attempting to Bypass the evaluation.

SUMS Template - Proposed Questions

SUMS Early Engagement (Four Questions) (Optional)

Questions on: Participation and Engagement | How has your group engaged during the early stages of the project?

Likert Scale Set:

1. Strongly Disagree | 2. Disagree | 3. Neither Agree Nor Disagree | 4. Agree | 5. Strongly Agree

- It has been easy to engage with all the members of the group.
- All the group members are collaborating actively in the coursework.
- The group members started discussing the coursework in a timely manner.
- The group started working promptly to ensure timely delivery of the project.

Group Dynamics (Five Questions)

Questions on: Conflict Management | Improvement Culture | Interpersonal Support | Group Performance | Group Satisfaction

Likert Scale Set:

1. Strongly Disagree | 2. Disagree | 3. Neither Agree Nor Disagree | 4. Agree | 5. Strongly Agree

- Our group manages disagreements well
- I am comfortable giving constructive feedback to my peers
- Someone in my group would help me if I needed it
- Our group performs well
- I am very happy to be working in our group

Individual Accountability (Three Questions x No. of Group Members)

Questions on: Work Contribution | Reliability | Accountability

Likert Scale Set:

1. Strongly Disagree | 2. Disagree | 3. Neither Agree Nor Disagree | 4. Agree | 5. Strongly Agree

- Contributes more and/or higher-quality work to the group
- Is very reliable (attendance, deadlines)
- Exercises personal responsibility (communicates absences, catches up if absent)

Teamwork Skills (Four Questions x No. of Group Members)

Questions on: Group Progress Awareness | Motivating for Quality | Collaboration | Initiative

Likert Scale Set:

1. Strongly Disagree | 2. Disagree | 3. Neither Agree Nor Disagree | 4. Agree | 5. Strongly Agree

- Watches conditions affecting the team and monitors the team's progress
- Motivates the group to do excellent work
- Asks for and shows interest in colleagues' ideas and contributions

- Exercises initiative

Free-text Questions (optional)

Paragraph questions about the state of the group and a potential direction of improvement.

- Thinking about how your group is working, please write one positive comment
- If there is one thing you would like the group to do differently, what would it be?

Module-specific aspects of Group-work (optional)

Questions as determined by the Module Leader.

Assessment Augmentors

Pre-assessment Activity

Wanner, T., & Palmer, E. (2018) reports that learners found two pre-assessment activities useful:

1. A practice session on assessing self and peers
2. A session on how to use assessment criteria for self and peer assessment

This activity has two main benefits: gives confidence to learners as assessors; and, it can render the response data from each sample more reliable.

Post-assessment Survey

Wanner, T., & Palmer, E. (2018) surveyed learners after the peer assessment as a means of:

1. getting the learner to reflect on the benefits of peer assessment; and,
2. obtaining satisfaction data for the continuous improvement of the assessment process.

A subset of the questions, derived from Bank Three, is below:

- It was a valuable part of assessing my own learning
- It helped me to improve my work
- It was a good use of my time
- It should be part of most courses
- I was confident in marking other people's work
- The student peer reviewer should give feedback along with the mark [adapted by LY]
- I learned a lot from giving feedback to my peers
- I learned a lot from receiving feedback from my peers
- I modified my work based on the feedback provided to me by my peers

The survey closes the loop, not of the module-specific peer assessment, but of the experience of using a peer assessment formatively.

Benefits

Taken all together, the pre-assessment activity, rounds of peer assessment, and post-assessment survey, combine to form one unit of a peer-assessment blockchain which can be analysed across a programme.

The sequence prepares the learner for assessment, develops teamwork abilities, encourages reflection upon progress, and anticipates future progress.

Peer Assessment In-Module Schedule

Academic buy-in activity (optional)

Scoping

Student buy-in activity (optional)

Scoping

<https://www.gre.ac.uk/learning-teaching/assessment/assessment/design/formative-vs-summative>

To engage students in formative assessment:

- Explain the rationale behind formative assessment clearly – make it clear to students that through engaging with formative tasks they get to gain experience with their assessments, risk-free, and can develop far stronger skills in order to obtain better grades in the summative assessments.
- Create a link between summative and formative assessment – design formative assessments in such a way that they contribute to the summative task. This lowers the workload on the students and provides them with necessary feedback to improve their final performance. An example of such assessment is producing an essay plan, a structure of a literature review, part of the essay or bibliography.
- Lower the number of summative assessments and increase the number of formative assessments – yet do not allow one single summative assessment to carry too much weight in the final grade.

Tie in with employability interview questions

Pre-assessment Activity (optional)

Scoping

Peer Assessment, first round

Peer Assessment, second round (optional)

Peer Assessment, final round

Post-assessment survey (optional)

Phases of Project Implementation

Phase I : SUMS Peer Assessment Template

Agreement of question bank
Creation of question bank
Trial deployment
Testing / validation
Guidance on installation of peer assessment

Phase II : Buy-in Activity

Design/Implement Academic buy-in activity
Design/Implement Student buy-in activity

Phase III : Post-Assessment Survey

Agreement of question bank
Creation of question bank
Trial deployment
Testing / validation
Guidance on installation of post-assessment survey

Phase IV : Pre-Assessment Activities

Design pre-assessment activities
using learning intentions and success criteria

In order to provide thoughtful and detailed feedback, students need both guidance and practice in the following areas:

- How to give constructive feedback
- How to receive feedback
- How to generate assessment criteria (if students participate in the development of assessment criteria/standards)
- How to use a rubric/evaluation form to follow

From: Preparing Students for Self- and Peer Assessment

https://www.queensu.ca/teachingandlearning/modules/assessments/30_s3_08_preparing_students_for_assessments.html

How to introduce it

- Involve students in defining/clarifying success criteria - the descriptions of what achievement of the learning intention/s looks like.
- Work with samples - exemplars and examples make the criteria visible for students.
- Teach students how to apply criteria - explicit instruction and modelling helps students understand what constitutes 'quality'.
- Provide guidance as students apply criteria - applying criteria to anonymous samples deepens understanding of the criteria.
- Support students in peer assessment and feedback - prompts including sentence starters and feedback forms help students to give appropriate feedback.

From:

<https://education.nsw.gov.au/teaching-and-learning/professional-learning/teacher-quality-and-accreditation/strong-start-great-teachers/refining-practice/peer-and-self-assessment-for-students>

Quick keys to successful peer review

- Identify and teach the skills needed for peer review. Encourage students to respond as a peer, not as a teacher.
- Present peer review as an opportunity for students to receive extensive feedback on their work.
- Explicitly link peer review with the course learning outcomes (what you want students to know, value, or do). For example, "At the end of this course, you will be able to effectively assess the strengths and weaknesses of peer papers and make concrete suggestions for improvement."

From:

<https://teaching.cornell.edu/resource/teaching-students-evaluate-each-other>

Exercise examples/ideas from KCL:

<https://blogs.kcl.ac.uk/aflkings/rich-in-informal-feedback/peer-evaluation/>

'Marking Workshop' Oxford Brookes

<https://www.brookes.ac.uk/WorkArea/DownloadAsset.aspx?id=2147552652>

Topping, K. J. (2009). Peer Assessment. *Theory Into Practice*, 48(1), 20–27.

<http://www.jstor.org/stable/40071572>

Marking exercise detailed

Trial deployment
 Testing / validation
 Guidance on pre-assessment activities

Wanner, Table 2:

Week	Activities	Principle
1	Students are introduced to the assessment format in the first lecture; and provided with information about self and peer-assessment.	1, 9
2	Students do a quiz about assessment requirements. One of the questions is about self and peer-assessment.	1
3	Face-to-face tutorial (2 h) about self and peer-assessment: the purpose and value of self and peer-assessment is covered; assessment criteria are developed and discussed; and a practice run of self and peer-assessment is done using a sample assignment. At the start of the session, they worked in pairs and provided peer feedback to each other for a short (300 words) critical review they had prepared for the reading of the week.	1, 2, 3, 9
6	Students submit the final draft of their assignment. PeerMark in Turnitin allocates each student two assignments for peer-assessment anonymously.	7
7	Students complete two peer-assessments and a self-assessment of their own assignment using the assessment rubric. No grades are requested or recorded. The process itself is worth 10% and due back within a week	4, 5, 6, 7, 8
8	Students resubmit their revised assignment for marking by the course convenor.	

Phase IV : Expanded Scope

Activities around data interpretation

“What would success look like?”

The best outcome would be individuals who possess and value the ability to perform well in teams.

The peer assessment would ideally provide the module leader with the ability to recognise the behavioural pattern of a group over the lifespan of the assessment based on the output data from the various sampling points, and referencing a team development model, for example, Bruce Tuckman's “Stages of Small-Group Development Revisited” (1977).

Judith Stein advises that using data garnered in this would be beneficial as the basis of a conversation, rather than a strict diagnosis.

Should the blockchain assessment system serve its purpose, we would expect to observe our learners establish performing groups reliably, and more quickly (if the tasks and group sizes are comparable) or more capably (when faced with more challenging projects), across the entire lifespan of their time at SUMS.

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