

# INDAF: an App that produces Individual Assessment Feedback

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## Abstract

I developed an App (INDAF) that analyses the part marks that are awarded in a typical marking process. For each student, it then produces an individualised assessment feedback report, which highlights excellent areas and areas for development within their assessment. In the SSEHS-wide rollout in January 2022, 5,754 feedback reports across 42 modules were produced using INDAF, and over 4,000 were viewed by students. Students rated receiving such additional individualised feedback overwhelmingly positive, highlighting the value for their future learning. Staff highlighted the minimal extra time to set up INDAF, as well as the reduced student queries on marks release day.

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## 1. Background

High quality feedback is regarded as the most powerful single influence on student achievement (Hattie & Timperley, 2007). Ideally, feedback should be a 'dialogue', and offer the option of 'corrective advice' (Wilson, 2012). However, this requires a significant time commitment from the person giving the feedback, especially under the backdrop of growing student numbers. 'Ideal' feedback can therefore heavily impact on staff workload, to an extent that may be untenable. On the other hand, the issue of the low NSS student feedback scores across the sector must be addressed.

Exam marking often consists of adding up part marks to produce a final overall mark. Within SSEHS (and across Loughborough University), as students' exam performance feedback is often limited to them receiving their overall exam mark, a large untapped potential to provide students with individualised feedback lies in the evaluation of these already existing part marks. This allows large-scale provision of additional individualised feedback whilst minimising increases to staff workload.

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## 2. Methodology

I developed an application (called Individual Assessment Feedback, INDAF), which extracts the information of existing part marks by an automated process and produces a feedback report. The following outlines the procedure for an example exam consisting of 8 questions:

- The module leader assigns exam questions to thematic subcategories (for example, questions 1-3: subcategory 1 (Physiology); questions 4-5: subcategory 2 (Anatomy); questions 6-8: subcategory 3 (Research methodology); questions 1, 3 and 7: subcategory 4 (Calculations).
- Upon marking, each student's performance is rated overall (out of the 8 questions, e.g., 50%). In addition, INDAF calculates a mark for each subcategory (e.g., Physiology: 77%; Anatomy: 55%, Research methodology: 30%, Calculations: 55%). INDAF further highlights any particularly strong, but also particularly weak areas.
- An individualised assessment feedback pdf report is produced for each student.

In two pilot trials (Semester 1 and 2 exams, 20/21), SSEHS staff and student feedback on creating and receiving these reports was collected and used to further fine-tune INDAF. Students rated the provision of this extra feedback very positively, leading to the SSEHS-wide INDAF roll-out in 21/22.

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## 3. Issues

Staff had to adapt their approach to marking by using INDAF, which was met with resistance by some. To minimise staff resistance towards INDAF, staff feedback obtained during the pilot phases as well as informal consultation with colleagues informed the App development. I further aimed to reduce barriers by minimising the overall administrative workload (e.g., automating the process of

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uploading reports to the students' profiles), and by minimising extra staff workload by training a dedicated INDAF Admin support person. I further created help videos based on screen capture recordings to allow independent use of INDAF. These were supplemented with written user guides.

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### 4. Benefits

The main benefit lies in the extra individualised feedback given to students - in addition to an overall grade, they are provided with a detailed account of their exam performance. A main strategy to make the rollout successful was to involve staff throughout the process, allowing INDAF features to be applicable to the whole range of assessments within SSEHS. Finally, the positive student perception data gathered during piloting supported the case for a School-wide rollout.

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### 5. Evidence of Success

All staff engaging with the process were able to produce feedback reports for their modules (overall: 5,754 individualised feedback reports across 42 modules). Student engagement with the feedback reports was high (>4,000 were viewed by students). **Student comments** included:

- "I really like this concept as I often wonder where to concentrate my focus for the next semester. Would be especially helpful for modules that semester 1 content can be included in semester 2 exams."
- "I thought the feedback system was brilliant and really appreciate knowing where my weaknesses lie within the module."
- "The mark breakdown and (especially) question subcategories are useful as this clearly shows the types of questions I felt most and least comfortable approaching. Thank you!"

**Staff comments** on using INDAF included:

- "Minimal extra time to set up INDAF"
  - "Reduced student queries on marks release day."
  - "The system allows for feedback to be given with relative ease to the students, it will also allow internal and external moderation to be more transparent."
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### 6. How Can Other Academics Reproduce This?

INDAF can be shared across university (currently via the shared drive). This is tried and tested, the Wolfson School has successfully piloted INDAF in this year's exams with plans of further implementation going forward. INDAF has a wide application range, as it produces individual feedback reports for any assessment that can be subdivided into subcategories. In SSEHS, it has mainly been used for short answer and essay-type assessments. INDAF is best suited for quantitative assessment analysis (i.e., analysis of part marks), but also offers the option to include individual qualitative comments (which may be particularly relevant in essay-type assessments). For access to INDAF, including help videos and user guides, please contact [c.a.leicht@lboro.ac.uk](mailto:c.a.leicht@lboro.ac.uk).

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### 7. Reflections

The SSEHS-wide INDAF roll-out was facilitated by the support of the SSEHS Associate Dean for Teaching and the Director of Undergraduate Studies. Central to the success was integration of staff and student feedback to fine-tune processes and to provide options to tailor INDAF to the different modules' requirements. A solid administrative process was essential to the smooth running during the exam period. Next steps may entail inclusion of INDAF within University systems (e.g., Learn).

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### 8. References

- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81–11.
- Wilson, A. (2012). Student engagement and the role of feedback in learning. *Journal of Pedagogic Development*, 2(1), 15–19.

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## Example individual feedback report given to the student

### Physiology of Exercise and Training Feedback report

#### Student performance summary

B111111	Your mark	Your grade (%)
Overall (out of 80)	40	50

Subcategories	Subcategory mark	Percentage	Comment
Physiology (out of 30)	23	77	excellent
Anatomy (out of 20)	11	55	-
Research methodology (out of 30)	9	30	area for development
Calculations (out of 40)	22	55	-

Percentage scores are colour coded. The darker the shade of green, the better the percentage score.

Comment area: Subcategories with excellent scores are flagged blue, areas for development are flagged orange.

#### Individual question overview

Questions	Maximum mark	Your mark
Qu. 1	10	8
Qu. 2	10	7
Qu. 3	10	8
Qu. 4	10	9
Qu. 5	10	2
Qu. 6	10	1
Qu. 7	10	0
Qu. 8	10	5
Whole exam	80	40

optional section

#### Individual comment

Very well done on aspects ABC, not so well done on aspects DEF.

optional section

#### Generic feedback

On a group level, this was not a very strong exam performance (average in the low fifties). Whilst some questions were very well answered, some lacked an element of explanation, which indicates they may have been taken from various sources and have not been "truly" understood.

In this report you can check your own performance in the subcategories of this exam. I would also suggest that you focus your exam debrief on your areas for development, as they may be essential to enhancing your understanding in year 3.

##### Exam-specific feedback

- I am not sure whether many of the cohort understood that some aspects of anaerobic metabolism can ONLY be measured intracellularly, hence necessitating a muscle biopsy to get an overall understanding of anaerobic muscle metabolism (and that a blood lactate sample is an extracellular measurement).
- Perceived exertion and applications: read up on estimation and production trials. Also, "blinding" of the participant for this question is blinding to ANYTHING other than RPE - so participants should be blinded to feedback on heart rate, exercise intensity, pedal rate, etc.
- Many forgot to mention hyperplasia as a potential mechanism for strength gain that is unrelated to hypertrophy.

As an additional resource, please also refer to the generic exam feedback which will be posted on Learn.

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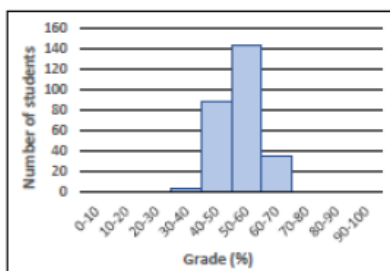
Example statistics overview provided to the module leader (cohort analysis)

## Analysis

Assessment: 21PSB713

Basic statistics Whole cohort Excluding Zero mark assessments

Number of students	298		272	
Maximum marks awarded	80			
	Marks scored	Grade, %	Marks scored	Grade, %
Average	38.2	47.7	41.8	52.3
Standard deviation	12.8	16.0	5.1	6.4
Median	41.0	51.3	42.0	52.5
Minimum	0.0	0.0	26.0	32.5
Maximum	56.0	70.0	56.0	70.0



## Distribution detail, by question (excluding Zero mark assessments)

	Whole exam	Qu. 1	Qu. 2	Qu. 3	Qu. 4	Qu. 5	Qu. 6	Qu. 7	Qu. 8
Maximum marks awarded	80	10	10	10	10	10	10	10	10
Average (marks scored)	41.8	2.7	2.5	5.2	8.6	4.7	5.1	3.5	9.5
Standard deviation (marks scored)	5.1	1.7	1.1	1.4	1.2	3.0	2.0	2.2	0.5
Average (Grade, %)	52.3	27.2	25.3	52.3	85.7	46.6	50.9	35.4	95.0
Standard deviation (Grade, %)	6.4	16.7	11.1	14.1	11.5	29.8	19.9	21.7	5.0

Number of students per percentile										
0-10%		38				27		29		
10-20%		37	64			24		30		
20-30%		35	68			26	36	37		
30-40%	3	66	71	44		26	42	33		
40-50%	89	45	69	45		28	29	44		
50-60%	144	51		57		32	39	41		
60-70%	35			56		28	41	28		
70-80%	1			70	66	24	50	30		
80-90%					66	19	35			
90-100%					140	38				272
Total	272	272	272	272	272	272	272	272	272	272

## Distribution detail, by subcategory (excluding Zero mark assessments)

	Whole exam	Physiology	Anatomy	Research methods	Calculations
Marks awarded	80	20	20	20	40
Average (absolute)	41.8	5.3	13.8	9.8	18.3
Standard deviation (absolute)	5.1	2.1	1.8	3.6	3.2
Average (%)	52.3	26.3	69.0	48.8	45.7
Standard deviation (%)	6.4	10.3	9.2	18.0	7.9

Number of students per percentile					
0-10%		8			
10-20%		50		14	
20-30%		89		26	2
30-40%	3	82		34	57
40-50%	89	43		50	117
50-60%	144		30	61	86
60-70%	35		92	42	10
70-80%	1		90	32	
80-90%			60	12	
90-100%				1	
Total	272	272	272	272	272