T-LEVELS | IfATE Institute for Apprenticeships and Technical Education

Chief Examiner Report

T Level Technical Qualification in Science (Level 3) (603/6989/9)

Summer 2024 – employer set project

NCFE CACHE

Chief Examiner Report

Summer 2024 – employer set project (Laboratory Science)

Assessment Dates: **13 May 2024 to 24 May 2024**

Paper Number: **P002422**

This report contains information in relation to the externally assessed component provided by the chief examiner, with an emphasis on the standard of student work within this assessment.

The report is written for Providers, with the aim of highlighting how students have performed generally, as well as any areas where further development or guidance may be required to support preparation for future opportunities.

Key points:

- grade boundaries
- standard of student work
- evidence creation
- responses to the external assessment tasks
- administering the external assessment

It is important to note that students should not sit this external assessment until they have received the relevant teaching of the qualification in relation to this component.

Grade boundaries

Raw mark grade boundaries for the series are:

	Overall
Max	147
A*	131
A	116
B	99
C	83
D	67
E	51

Grade boundaries are the lowest mark with which a grade is achieved.

For further detail on how raw marks are converted to uniform mark scale (UMS), and the aggregation of the core component, please refer to the Qualification Specification.

Standard of student work

Overall, the standard of student work seen in this series was of a good quality, with students attempting all of the set tasks within the employer set project (ESP). Most Providers had prepared students well for the ESP, with those students who had sat a mock ESP able to reflect on feedback given to them and use this to improve areas of weakness. A range of achievement was seen within the component, with students achieving at all grades available. Many students had reviewed a wide range of literature sources with many using their findings to inform their planning for task 2. Many of the students found the topic area challenging;

with many focusing on the irradiation process, rather than the data collection methodology and monitoring of the investigation. A range of achievement was seen across the cohort, with some finding the data analysis task quite challenging. Providers should allow students to be familiar with the range of statistics and their application, it is encouraged that students use the Microsoft Excel spreadsheet that is provided, but this is not essential; however, the worked examples on the spreadsheet or paper should be included, so the process can be assessed by the examiner. Some of the video evidence provided was not of a high quality, some had poor sound quality, where the student could not be heard clearly and a few had very poor lighting. Examiners also found it very helpful when the students identified themselves at the start of the video or discussion. This also helps to ensure the correct student is assessed and additional evidence can be requested when the wrong group video is uploaded in error.

This is expanded upon later where there is a task-by-task breakdown.

Evidence creation

Providers should upload a signed declaration form and checklist. The checklist will help the Provider to ensure the correct documents are uploaded and where any evidence is missing this should be made clear, so that examiners know the student has not submitted or work has been lost.

It was pleasing to see that most students had used the proformas provided to capture their work, particularly for task 1 ‘research a strategy’, task 2 ‘risk assessment form’, and task 6 ‘reflective evaluation’. Providers are encouraged to use the proformas, as these facilitate responses that meet the grading criteria. Where students did not use these proformas, it was not uncommon to note that certain aspects of the task had been missed out, for example the referencing technique used. There were a number of instances where the proforma for the risk assessment was used but residual risk was not considered after the control measures were in place.

Some Providers submitted excellent video evidence for task 4(b) and task 5(a), with good quality sound and lighting. However, several Providers submitted video evidence that did not play, had no or very poor quality sound. It is recommended that Providers double check recordings prior to submission in order to ensure the quality of them.

Some Providers facilitated identification of students in the group discussion by means of verbal introductions, or by students holding up a sheet of paper with their name on it. This practice was very helpful to examiners when viewing this evidence and awarding marks. Providers are asked to check that the correct video evidence for task 5 is submitted as there were a small number of cases where the group discussion did not include the student whose work was being examined.

As most of the evidence was typed, there were no issues in reading the submitted work.

Responses to the external assessment tasks

Task 1: research a strategy

Generally, students performed well in this task, with many producing work that met the descriptors for band 3 and 4. The highest performing students discussed a wide range of sources and included a consideration of the availability or otherwise of quantitative data and how a source would be of use to them in subsequent tasks. Omitting this information limited the marks available for this section for some students. Some students found this more challenging and focused mainly on the reliability and relevance of the source, rather than saying how the information within it could be used in the setting.

A number of students ran out of time on this task, only reviewing a small range of the sources available, they often described their poor time management in their reflection and evaluation. Providers should use formative assessment to allow students to be more confident in this task and in their time management in general.

The quality of referencing was generally very good, but there were still a significant number of students who provided hyperlinks rather than using a recognised academic referencing technique. Students should be encouraged to use in text referencing and not just to reference the source. Some Providers were not using the proforma provided, it is not essential to do so, but should be encouraged as it does assist students to include the name of the referencing technique they are using, and the sources they are selecting and rejecting along with their justifications. There were some Providers where students were accessing the internet and searching for how to reference or even using 'cite me' software. This is not permitted under the conditions of this assignment. Providers should prepare students in advance using formative assessments and mock employer set projects, so that the students are prepared for this assessment. Some Providers were not uploading the browsing history as listed under 'The evidence I have to submit for this task'.

Task 1: English, mathematics and digital skills

The quality of written work was generally very good, with many students able to demonstrate at least a well-developed use of level 2 English spelling, punctuation and grammar, and using the appropriate professional tone for this task. Common errors were to write the literature review in the first person, and not use a more formal third person approach as would be appropriate, or to use 'talked about'.

Task 2: plan a project

Most students were able to produce a plan with aims relevant to the brief. Some students were able to base their plan on information gained from a range of sources selected in task 1 and cited references within their plan. Many of the students found the topic area challenging; with many focusing on the irradiation process, rather than the data collection methodology and monitoring of the investigation. Many students failed to consider the principles of good scientific design and omitted to consider, aims, controls, variables sample size, replicates etc. within the plan and methodology. A common error was to have a limited description of data to be collected. Many students were not aware of analytical techniques and sampling techniques, some considered you could count the number of bacteria present on a microscope slide, using a light microscope, to obtain reliable data.

The majority of students were able to assess the risk rating and residual risk after control measures were in place; however, fewer were able to describe the key risks involving others with understanding of the risk hierarchy (prioritisation). Some lower achieving students were unable to suggest appropriate mitigating steps and control measures with a few unable to calculate the risk rating.

Task 2: English, mathematics and digital skills

Many risk assessments contained very little scientific/technical terminology, with only higher attaining students communicating in appropriate professional tone. It may be worthwhile for Providers to provide students with examples of risk assessments during their preparation for the employer set project (ESP), to exemplify the required professional style that a risk assessment for a scientific procedure should demonstrate.

Task 3: analyse data

This was a challenging task for many of the students, with many students unable to correctly interpret the data provided. Overall, students performed well on this task. Most were able to analyse the data, calculate mean and standard deviations, produce graphs or charts and draw conclusions. Most students attempted some form of statistical analysis, with a t test or Spearman's rank being the most popular; however, many students appeared confused over how to correctly interpret the results of the t test, limiting the marks available for this task. Many students struggled in the selection of data and analysed the precision of the replicates rather than the trends in the decay of bananas at different radiation rates over a period of time. Many of the lower performing students were not providing graphs and tables that added value to the analysis and enhanced readability and understanding. Very few students discussed the limitations of the data. Where

students did notice anomalies in the data, they still included them in their analysis. For some students, the lack of written conclusions from their data analysis limited the marks available for this task.

Task 3: English, mathematics and digital skills

Generally, students performed well in this area. Some students only provided evidence of data analysis with no conclusion or link to the investigation aims, this therefore limited the mark awarded. Where students had included the results of their data analysis within the format of a written structured report, higher marks could be awarded. Many students expressed a lack of understanding of how to use Microsoft Excel to perform statistical analyses, even with the provided statistical analysis pack, Providers are advised to provide students with the opportunity to learn this as part of their preparation for the ESP.

Task 4: Presentation of outcomes and conclusions

Most students performed well in this task, with many producing scientific posters that were accessible to the audience and explained the investigation aims, plan, results analysis and conclusions. Only a few students were able to employ concise explanations, and a small minority produced scientific posters with only very limited details. Some students included too much detail on their poster, with a large amount of writing, rather than a summary of the main points. Additionally, some students assigned much of the poster to the introduction, method, risk assessment and raw data, leaving only a small area of the poster for their graphs and charts – this limited the marks available for this task. Most students produced a scientific poster using PowerPoint, others chose to produce a poster by cutting and pasting text and graphs onto paper, a few students wrote directly onto the sheet of A2 paper. Many students were able to confidently present a poster, but a number were still reading off their poster. Providers should attempt to build opportunities for practising verbal presentation into their delivery of the course and preparation for the ESP. Students should articulate the information they are presenting such as: the aim was… the conclusion shows… Some students are being instructed to make their presentation last for 40 minutes, it is not essential to fill the full time allowed, this time includes practice time. Tutor questioning if used should be to encourage the student to expand on a topic.

Task 4: English, mathematics and digital skills

Generally, students performed well in this section, demonstrating their ability to use mathematics and digital skills to organise and present their data analysis.

Task 5: group discussion

Students performed well in this section, with almost every student demonstrating engagement and an ability to participate effectively in the group discussion. Students appeared familiar with the task and what was expected of them. They were able to contribute to the group discussion, showing a reasonable breadth of knowledge. Some students asked questions of their peers, a few checked the understanding of others within the group. It should be encouraged that peers ask questions of the quieter students to make sure they are included. It was very helpful to the examiners when the students identified themselves or had their name on a card in front of them. Smaller group sizes, for example 3 or 4, allowed the students to have more time to speak and to demonstrate breadth and depth of knowledge and understanding. The quality of the videos was generally good. Providers must make sure all students' faces can be seen and that the sound quality is good. This should be checked before the discussion starts. Providers must make sure the correct evidence is provided, some of the evidence did not include the student being assessed.

Most students produced an email that responded to the concerns raised by the company. The higher achieving students were addressing all the concerns raised by the company and suggesting valid solutions, the lower achieving students were only addressing the initial concerns raised.

Task 6: reflective evaluation

Reflection and evaluation are areas students traditionally find more difficult. Students were able to provide a description of the tasks they had undertaken. They were able to provide an account of what had worked well and less well, but could not articulate how they could improve beyond generic statements such as ‘manage my time better’ or ‘get better with data analysis’. Many students were not justifying their choice of statistical analysis or how the impact of their decisions in one task could impact on following tasks. Higher achieving students could pinpoint where a failure in one task had impacted upon other tasks and could explain how specific improvements would help their performance.

Task 6: English, mathematics and digital skills

Most students were able to communicate their reflective evaluation with a well-developed use of level 2 English. Some students did not read through their work and correct spelling and grammar errors.

Administering the external assessment

The external assessment is invigilated and must be conducted in line with our Regulations for the Conduct of External Assessment. Students may require additional pre-release material to complete the tasks. These must be provided to students in line with our regulations.

Students must be given the resources to carry out the tasks and these are highlighted within the Qualification Specific Instructions for Delivery (QSID).