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Moderators' Report/ Principal Moderator Feedback

Summer 2012

Principal Learning

Manufacturing & Product Design
Level 3 Controlled Assessments

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Unit MP303_01

Supply Chain Management in Manufacturing

General comments

During this series, the internal marking for this unit was mixed; with some inconsistency in the approach taken by assessors. Case studies were used as an assessment instrument for this unit.

Learning Outcome 1

This outcome focuses on three principles. The importance of cost effectiveness in supply chain management, how supply and demand can be integrated across companies and the laws that apply to supply chain logistics.

Candidates were able to provide an overview of the organisation considered in the case study and many discussed a large range of manufacturing principles and concepts. Much of this evidence did not link to supply and demand issues and the management of the supply of goods and raw materials, procurement, transportation and logistics, material handling etc. Consequently whilst the supply chain process and cost effectiveness were alluded to in places they were not directly evidenced, with no precise focus on this element in any of the work moderated. Similarly the integration of supply and demand was mentioned in a limited fashion throughout the reports, rather than in one specific section. Candidates mentioned laws often quite specifically but few went beyond simply summarising them and did not indicate how and why specific laws apply to the supply chain.

Learning Outcome 2

This outcome has two elements; how supply chain problems can be addressed through procurement, logistics and lean manufacturing and the importance of a customer focus through the supply chain.
Evidence for this outcome was presented via a series of problems encountered in the case study and how these had been solved. A few of these solutions involved supply and demand issues, although many didn't, and the issues of logistics, procurement and lean manufacturing were featured in one or two of the solutions.
The importance of customer focus was investigated briefly by a few candidates and touched upon, amongst other responses, by others. This indirect approach to the assessment means candidates produced thorough responses but the supply and demand element was often only limited.

Learning Outcome 3

LO3 is separated into two elements, the first being an analysis of the supply chain process and the second being an opportunity to provide solutions to supply chain problems. There is an expectation that candidates will consider strategic, operational and tactical ideas. The unit specification gives

significant guidance on the types of evidence expected. Although candidates did not subdivide their evidence in this way, there is some evidence of limited strategic awareness, and operational considerations are in evidence throughout, albeit in a partial manner. As the candidates' evidence is based upon a case study the problem and solution technique evidenced allowed those candidates who supplied a wide range of issues to demonstrate evidence worthy of MB3 performance.

Conclusions

Using case studies is an ideal opportunity to put issues of supply chain management in context. Most candidates produced comprehensive reports that give a substantial overview of the case study and discussed a range of issues and operational parameters. There is however much of this that is not connected to supply and demand and these are the key principles that should be the main focus of every element of candidate evidence for this unit.

Unit MP304_1A

Management of Resources and Working Practices in Manufacturing

General comments

The evidence presented for this unit was built around investigations of local companies. Although only limited entries were noted for this unit, assessment generally appropriate across the learning outcomes.

Learning Outcome 1 (Marking Grid A)

This outcome focuses on employment/operational practices and recruitment/training procedures. Candidates gave an overview of the organisation they considered as a case study/work experience. Descriptions of employment and operational practices including recruitment were generally well answered however the responses to training and development were less comprehensive.

Learning Outcome 2 (Marking Grid A)

This outcome focuses on strategies used by supervisors to ensure effective contributions by employees. Candidates explained some elements of the personal approaches based on interviews however this did not allow them to cover the anticipated breadth outlined in the specification. Candidates did little more than give a brief description of strategies, for the most part restricting them to marks below MB3.

Learning Outcome 4 (Marking Grid A)

This outcome concerns employment law and the involvement of legislative bodies. Candidates gave responses stating some of the laws/legislation with some outline of the implications within the organisations they considered. No candidates were able to give the level of description required for MB3.

Conclusions

The assessment for this unit is based on organisations visited by candidates and/or work placements. This is an approach that should be encouraged, however there are limitations. Because the entirety of the evidence presented is based upon these organisations there are some elements that have not been covered in sufficient detail. It might therefore be appropriate to include some extension activities to allow candidates to access more of the MB3 criteria.

Unit MP305_1A

Research, Development and the Introduction of New Products in Manufacturing

This unit follows a process, from the factors that inform the design process, the use of product development techniques, to the solution of design problems and evaluation of these solutions/prototypes. The assessment of this unit is mostly lenient and not in line with national standards. Where centres use industrial visits, and link these to a case study, appropriate evidence can be generated. Unfortunately some elements of the process, as presented in the marking grid, were often missing or limited at best.

Learning Outcome 1 (Marking Grid A)

There are three strands to this LO. Firstly it would be anticipated that candidates would consider the issues and principles that inform the design process. Whilst the ethical, environmental or social implications were often considered to achieve marks in MB3 a description of the key issues and principles of design would be anticipated.

The second strand focuses on the use of trials, testing and how prototypes are used to develop new products. Normally written responses outlining this process would be anticipated however the majority of candidates did not present any explicit evidence of this.

Some limited evidence was presented in response to the third strand, which requires candidates to consider the legislation relating to new product design, however brief responses often only focussed on the use of the BSI with no other significant reference to either standards, EU and ISO regulations or specific legislation.

Learning Outcome 2 (Marking Grid A)

There are four elements to this learning outcome with candidates expected to carry out market research in order to develop a product design specification and hence develop at least two possible product designs. Candidates analysed the design brief and demonstrated comprehensive product research and useful market research, which informed the development of product design specifications (PDS). Not all of these featured all of the expected elements, with legislation, environmental, transportation etc. not necessarily considered. Product designs were suggested, with good use of design sketches, CAD drawings and explanatory notes often presented. More able candidates managed to achieve high MB3 marks for this LO and this outcome was, for the most part, accurately assessed in comparison with other elements.

Learning Outcome 3 (Marking Grid A)

There are three strands to this learning outcome with, initially, candidates expected to evaluate the proposal and prototype. Candidates provided some evaluative comments although not often in sufficient detail or with consideration of the proposal and prototype. Candidates rarely presented questions or a questionnaire when collecting customer evaluations of their prototypes, although some feedback was gathered in evidence and some candidates included company feedback on their original design proposals. There was very little evidence of a redefined design specification, based on customer feedback, although some elements of redesign were seen. None of this was linked with the feedback on the prototype.

Conclusions

Candidates often produced impressive prototypes and designs and the use of design briefs from manufacturing companies is commendable, however, centres should consider amending assignment briefs to ensure coverage of all of the requirements of the marking grid.

Unit MP306_1A

Principles and Applications of Materials Science in Manufacturing

General comments

Where candidates have used company visits or appropriate practical tasks useful evidence can be generated. It is important to ensure that practical activities can be accommodated in the delivery of this unit, in order to meet assessment requirements. Moderation of this unit showed assessment to be a little severe for this series.

Learning Outcome 1 (Marking Grid A)

Physical, biological, chemical and mechanical properties were described and applied to a given product, clearly indicating where these materials are used. Some excellent use of annotated diagrams was noted and although the properties described were not sufficiently thorough to allow MB3 marks to be awarded, they did go beyond being brief (MB1).

Learning Outcome 2 (Marking Grid A)

This outcome focuses on the use of science and technology in manufacturing, particularly with regards to increasing production. This LO was evidenced with explanations of particular technologies, in some cases these were applied to a manufacturer used in a case study.

Learning Outcome 3 (Marking Grid A)

This LO has three strands; one of these requires candidates to consider how to produce a secondary material from a primary material, unfortunately no evidence to support this was noted. Health and Safety guidelines and an explanation of testing methodologies were adequately covered.

Learning Outcome 4 (Marking Grid A)

This outcome requires calculations and interpretation of results. Limited interpretation has been appropriately awarded, however the simple presentation of test results does not justify marks of any significance from this LO.

Conclusions

Where appropriate assessment activities or case studies are used candidates can develop some very good evidence for this unit. At this level relatively complex tasks are anticipated, in order to allow candidates to access the full range of marks. These tasks should be informed by the unit content and the specific requirements outlined in the marking grid.

Unit MP307_1A

Production and Processing Systems in Manufacturing

The majority of evidence presented for this unit consisted of written responses in the form of short reports. Moderation of this unit showed that centre assessment appeared to be overly lenient in some cases and assessment decisions that were a little severe in others.

Learning Outcome 1 (Marking Grid A)

This outcome focuses on the manufacturing principles that are applied when processing products. The range should include a consideration of lean manufacturing techniques; small, batch, mass and continuous flow production and sequencing of operations and critical control points. Candidates were able to produce plans and discuss lean techniques but did not adequately cover the range and consequently marks from MB3 were not available.

Learning Outcome 2 (Marking Grid A)

This outcome has two elements. The first focus is on legislation relating to manufacture, candidates gave responses to this element, some being applied appropriately to the practical activities. Candidates poorly evidenced the second focus on production planning, a critical element to this is the recognition of how plans could/should be improved and this was not adequately considered.

Learning Outcome 3 (Marking Grid A)

This outcome has two elements the first being a focus on how advanced technology is used in manufacturing. Limited evidence was seen here from many candidates, particularly as the use of advanced technology is expected and the use of a variety of straightforward equipment was often presented. The second element requires candidates to consider process control and the use of sensors, PLCs, closed loop systems etc. would be anticipated here. Some candidates were able to provide comprehensive responses allowing substantial marks to be awarded.

Learning Outcome 4 (Marking Grid A)

This outcome should allow candidates to record data and monitor it to ensure quality processes are in place. The evidence is again often limited with some evidence of tests although not in the detail anticipated.

Conclusions

The assessment for this unit is often based on a practical activity and this should be supplemented by additional tasks in order to allow full access to marks. Practical activities could require candidates to develop records of the

time that production operations take (LO4) and compare these with the standards set in the production plan, in order that modification could take place to improve efficiency (LO2). Candidates could investigate different production arrangements for products, perhaps by looking at cell layouts, U-shaped lines, JIT techniques etc. (LO1). This might naturally lead on to how modern technology such as robot systems and CIM procedures might be integrated into production (LO3).

Unit MP308_01

Management of Production and Processing Operations

The majority of evidence presented for this unit consisted of written responses in the form of short reports or case studies of local companies. Much of the evidence presented was assessed too leniently with credit being given for work that does not meet the evidence requirements of the specification.

Learning Outcome 1

This outcome focuses on how an exemplar enterprise plans and manages its production and processing operations. There are two aspects to this LO. For the first element candidates gave overviews or reviewed the process at a local manufacturer and described the management of production at the company. The second element requires candidates to consider agreed outputs from a manufacturing operation. All candidates struggled with this aspect although some portfolios had evidence of this elsewhere, demonstrating the value of using case studies.

Learning Outcome 2

This outcome is split into two elements. The first focus requires candidates to consider how modern manufacturing techniques are used to improve efficiency/effectiveness. Once again candidates were able to review the techniques (MB1), whilst some assessment/analysis is often present, this is varied in detail (MB2/3). The second theme concentrates on maintenance and its use in maximising productivity and reducing waste. Candidates provided commentaries of maintenance with some including the effect on productivity although the focus on reducing waste was not always present.

Learning Outcome 3

This outcome is split into three elements with the first being a specific requirement for candidates to use problem-solving procedures to improve the production process. Some candidates provided no evidence for this LO whilst others detailed a production operation they had designed and carried out, however there was no input related to issues or problems in the production process, nor were proposals to improve the production process indicated. Very limited marks could be justified for some collection of data in these cases but this element requires a practical approach to problem solving.
The second element requires candidates to demonstrate the skills required when designing a maintenance programme, some candidates presented no evidence whilst others included basic maintenance programmes (MB1), however few were sufficiently detailed to justify marks from MB2 or MB3.
The third element requires candidates to produce a risk assessment. The evidence of HACCP charts (from one centre) and the more usual risk

assessment matrices, often completed in some detail, shows a thorough approach being carried out (MB3).

Conclusions

Candidates often supply substantial portfolios however the requirement to carry out a problem solving activity, related to production, has not been addressed in any candidate work moderated this series. This may be an additional activity that centres add to assignment briefs in the future.

Unit MP309_01

Quality in Manufacturing

A variety of approaches has been taken in the assessment of this unit, with company visits and short reports being favoured. Assessment is broadly to national standards and in line with the requirements of the marking grid for this unit.

Learning Outcome 1

There are three elements to this LO. The first anticipates candidates will demonstrate knowledge of what quality means in manufacturing. Responses were reasonably detailed, both in reports and in commentaries based on case studies. The second element focuses on how poor quality affects profits; all candidates started to address this in varying amounts of detail with more able candidates able to give considered responses. The third element requires candidates to investigate total quality management (TQM); definitions and indications of the whole business approach were presented although how TQM is implemented was not considered significantly in any of the portfolios moderated.

Learning Outcome 2

There are two elements for this LO the first requires a knowledge of how standards are implemented and monitored using quality management systems. Generally brief responses characterised this where an understanding of the principles of ISO 9000 would be expected. The second element of this LO anticipates an evaluation of quality control processes used within two manufacturing sub-sectors. Many candidates only considered one sub-sector and consequently missed out on the full range of marks available.

Learning Outcome 3

This LO is broken down into two strands, the first being a practical activity. Some candidates audited a production process and presented useful diagrams and test results, however this practical approach was not uniform with data apparently being given to candidates in some cases. The second element focuses on the recommendations from these tests/audit and although candidates often provided brief comments linked to their data, few were able to make significant recommendations.

Conclusions

Using a visit as a method of contextualising quality in manufacturing is a useful approach, however the key focus for assessment is the marking grid and a practical activity would be expected to allow LO3 to be appropriately assessed, using measuring techniques. This would allow the collection and analysis of data, which could then be analysed statistically and allow recommendations to be made.

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