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European Digital Learning Situation: Aspects of sustainable procurement

Target Group	Students in vocational training
Subject/Bundling subject	Economics
Learning Area	Procurement
Learning situation	Aspects of sustainable procurement in *Weltladen*

Entry scenario
The chairwoman of *Weltladen* has summoned you today because she has a very pleasant announcement. “Our sustainable wooden toy *Carrot Harvest on the Farm* has been named Eco-Toy of the Year 2022 by the trade press because it is made of a small number of harmless, single-grade and labeled materials, of which 95 % can be recycled. In addition, welded or glued joints in this toy were completely eliminated in this toy. Along with the puzzle pieces, the toy is one of the bestsellers of our *Weltladen*. Let's continue on this path and push the expansion of our ecological product line.”

Learning outcome/product
- Drawing up a plan of action (with the aid of word processing software)
- Recommendations for the *Weltladen* to act economically, ecologically and socially sustainable
- Decision regarding the purchase of fairly traded wood
- Calculation of material requirements
- Overview of advantages and disadvantages as a decision basis for procurement methods
- Total cost comparison in-house production or outsourcing

Essential competences
Students are able to consider ecological, social and economic aspects in procurement decisions

The students …
- can explain why sustainability is important for companies.
- can name entrepreneurial measures that are ecologically, economically and socially sustainable.
- are familiar with the concept and goals of fair trade.
- can make a calculation for the procurement of materials.

Specification of content
- Economic, ecological and social sustainability (three-pillar model of sustainability)
- Fair trade
- Gross/net material requirements
- Procurement methods
- In-house production or outsourcing

– can differentiate between procurement methods and recommend a course of action based on the advantages and disadvantages. – can compare in-house production and external procurement by calculation – reflect on the work process in terms of the use of digital/analog media, teamwork, etc. – reflect on the influence of the hardware/software used on their professional activities.	
Learning and working techniques - select content specifically - Cooperative work - Presentation by means of digital media and platforms - Reflection/feedback of the working process	
Teaching materials - Instructions - Information and Links/QR-Codes for the reseach	
Organizational information *Technical requirments* - PC room with projector, internet connection and the possibility to use standard office applications - Alternatively: classroom with WiFi and projector, students use their own devices	

Medienkompetenz, Anwendungs-Know-how, Informatische Grundkenntnisse

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European digital Learning Situation:

Aspects of sustainable procurement

Today, there is another meeting in *Weltladen*. The chairwoman of *Weltladen* summoned you today because she has a very pleasant announcement. “Our sustainable wooden toy *Carrot Harvest on the Farm* has been named *Eco-Toy* of the Year 2022 by the trade press because it is made of a small number of harmless, single-grade and labeled materials, of which 95 % can be recycled. In addition, welded or glued have been completely eliminated in this toy. Along with the puzzle pieces, the toy is one of the best sellers in our *Weltladen*. Let's continue on this path and push the expansion of our ecological product line.”

Task

1. Find possible reasons for the market success of the wooden toy *Carrot harvest on the farm*.
2. Name reasons why the topic of sustainability has a high priority for *Weltladen*.

1 Three-pillar sustainability model

Ecology	Social	Economy
• Careful and responsible use of the environment • The basis of life: Protecting the environment	• Global creation of sustainable and livable social conditions: Justice Prosperity Education Working life	• Reduction of resource consumption • Reduction of environmental impact • Long-term competitiveness

Success and future through responsible corporate action

Task

3. Work out concrete measures for *Weltladen*, in order to consider the ecological, economic and social responsibility. Take into consideration the entire procurement process with its activities inside and outside *Weltladen*.

   Proceed in two steps:
   First step: Collect suggestions for sustainable measures in the group.
   Second step: Assign the measures to the areas of ecology, economy and social issues.

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2 Participate in fair trade

In preparation for the production of wooden toys, *Weltladen* considers whether high-quality wood should be bought from a fair trade farm in Bolivia.

Task

4. By means of an internet research, explain the concept of fair trade and what goals are associated with it.

Fair trade is understood as ...	Fair trade goals ...
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Task

5. Collect reasons that would support a positive decision in *Weltladen* about the procurement of "fair trade" wood.

3 Calculation of requirements[1]

In the procurement department, the material requirements for the wooden toy C*arrot Harvest on the Farm* is determined. The department manager, Mr. Heys. has the following parts list:

Parts list wooden toy *Carrot harvest on the farm*			
Position	**Designation**	**Quantity**	**Unit**
1	Plate	1	pieces
2	Rack	1	pieces
3	Bracket	4	pieces
4	Screws	16	pieces

6. A primary requirement of 1.000 wooden toys is determined. Calculate the gross demand for materials (secondary demand)[2]:

Materials	**Plate**	**Rack**	**Bracket**	**Screws**
Quantity				

7. In the next step, Mr. Heys determines the net requirement of materials. In doing so, it is important to consider the available inventory. Clarify the connection with the net demand calculation for the following items[3]:

Explanation
Available stock
Reservation for other orders
Additional demand
Backorders

8. Calculate the net amount of materials needed for the wooden toy *Carrot Harvest on the Farm*.

Materials	**Plate**	**Rack**	**Bracket**	**Screws**
Gross requirements				
- Available stock	500	0	5.000	40.000
+ Reservation for other orders	400	0	4.500	20.000
+ Additional requirements	10	10	40	160
- backorders	600	0	0	10.000
= Net requirements				

[1] Adapted from: Blank et al. (2019): Betriebswirtschaftslehre mit Rechnungswesen. Westermann: Köln.
[2] information below
[3] information below

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Information about the calculation of requirements

The planning specifies the materials required for production in terms of type, quality, quantity and period. The quantity of material needed at a certain point of time or for a period is called demand. The demand for materials depends on the production program of the industrial plans. The exact determination of requirements is necessary for the following reasons:

- If too little material is procured, production can be disrupted and sales opportunities and the fulfillment of sales deadlines can be impaired.
- If too much material is procured, the capital commitment (interest and storage costs) would be unnecessarily high.

Gross requirements

In order to determine the gross requirement for materials, the demand for finished products and merchandise is first determined on the basis of short- and long-term production plans (primary demand). Then, the gross requirement of materials (dependent requirements) is determined by the production preparation department for the primary requirements and then the gross requirements for auxiliary materials, operating materials and wear tools (tertiary requirements). The parts lists of the products to be manufactured. If no parts lists are available, the requirement is estimated on the basis of the expected consumption data. The existing order and stock levels of the materials are not yet taken into account in this procedure.

Net requirements

In order to determine the net requirement of materials, from the gross requirement the available stock (= actual stock minus the minimum stock) and backorders (= inflow from existing open purchase orders) and the reservations for other orders and the additional reservations for other orders and the additional demand for materials are added. As an aid the stock files of the materials are used.

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4 Compare procurement methods

Task

9. You are asked to prepare a training on the procedures of procurement for the employees in *Weltladen*. For this, you prepare an overview with advantages and disadvantages of the procedures[4].

Order point procedure	
Definition:	
Advantages of this method:	Disadvantages of this method:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Ordering rhythm procedure	
Definition:	
Advantages of this method:	Disadvantages of this method:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

[4] information below

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Just-in-time procedure	
Definition:	
Advantages of this method:	Disadvantages of this method:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Information about the procurement methods

- Order point procedure:

In this procedure, materials are ordered on the basis of a predefined reorder quantity, i.e., the warehouse stock is automatically checked after each withdrawal and, when a predefined reorder level is reached, the warehouse issues a requisition to purchasing. By using electronic data processing (EDP), the ordering process is triggered automatically when the reorder level is reached. The minimum stock level (iron stock, iron reserve) is set for the individual materials for safety reasons and should never be attacked if possible. It is intended to ensure production readiness if, due to unforeseen events, the stock is not sufficient to continue production.

➢ Thus, the following formula applies to the determination of the reorder point:

Reorder level = (daily consumption * procurement or delivery time) + minimum stock level.

- Ordering rhythm procedure

With this procedure (ordering at certain, previously fixed dates), the fixed delivery dates are repeated periodically. The periodic fixing of the dates can be carried out with the aid of the optimum order quantity to be determined beforehand. This method is particularly suitable when there is a constant demand.

- Just-in-time-procedure

Just in time (Jit) means that all goods should be ready at exactly the right time and place.
This point of time is based on customer orders and the sales plan. Accordingly, the sales department informs the production department of the required quantities, which in turn notifies the suppliers so that they can be manufactured. All orders can thus be delivered at short notice without major delays. If this works well production "in stock" and the associated finished goods warehouses are avoided. This means less capital tied up and therefore lower storage costs.

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5 Make decisions about in-house production or outsourcing

Due to the great demand, the world store is considering the wooden toy *Carrot harvest on the farm* should be purchased by others.

10. Determine what basic preliminary considerations need to be made in order to decide whether the wooden toy should be outsourced or homemade.
11. For the following values determine whether in-house production or external procurement of the wooden toys is more cost-effective. A requirement of 1.000 pieces is assumed. The discount is to be fully utilized.

External purchase	
List price of the wooden toy	7.00 €
Supplier discount 5 %	
Purchase price	

In-house production	
Variable costs	
Material costs per piece	2.05 €
Labor costs per piece	2.10 €
Fixed costs	
Machine costs	2,000.00 €

Information about in-house production or outsourcing

These make-or-buy decisions are preceded by a whole series of considerations and calculations. Procurement and production in particular have to work closely together. Whether a company purchases certain parts or products externally depends on the following questions:

- Are production capacities free for in-house production?
- Can the required part be procured on the market in the required quality, time, design and quantity? This question also applies to machines and tools.
- Is in-house production or external procurement more cost-effective?

➢ Formula for calculating the total cost of external procurement:

Total Costs (external procurement) = List price * Quantity

➢ Formula for calculating the total cost of in-house production:

Total Costs (in-house production) = Variable costs * Quantity + Fixed Costs

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Total cost comparison

Quantity in units	Costs of in-house production in €	Unit costs of in-house production in €	Costs of external procurement in €
100			
200			
300			
400			
500			
600			
700			
800			
900			
1,000			
1,200			
1,300			
1,400			

➔ The critical quantity is _____ units

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Possible Solutions

1. Find possible reasons for the market success of the wooden toy *Carrot harvest on the farm*.

- Eco-Toy of the Year 2022
- It is sustainable
- Because it is made of a small number of harmless, single-grade and labeled material
- 95 % can be recycled
- No welded or glued joints in this toy

2. Name reasons why the topic of sustainability has a high priority in the *Weltladen.*

- Economic goals: long-term safeguarding of the company, increase in value added, high innovation potential
- Ecology: conservation of resources, reduction of emissions, preservation of ecosystems
- Social sustainability: equal rights, securing employment

3. Work out concrete measures for *Weltladen*, in order to the ecological, economic and social responsibility. Consider the entire procurement process with its activities inside and outside *Weltladen*.

For example:
- ecological responsibility: sell only sustainably produced products, no overproduction, sell regional products
- economic responsibility: survey demand, calculate prices economically, carry out advertising measures
- social responsibility: calculate fair prices, donate profits to social projects

4. By means of an internet research, explain the concept of fair trade and what goals are associated with it.

- The aim of Fairtrade is to make a significant contribution to development and to improve the lives of the people and families involved in production in the growing countries.
- Improved income situation and more financial stability for smallholder families
- Self-determination and assumption of responsibility by strengthening the organization
- Regulated working conditions and improved health protection on the plantations
- Protection of natural resources and promotion of organic agriculture

5. Collect reasons that would support a positive decision in *Weltladen* about the procurement of "fair trade" wood.

Advantages	Disadvantages
Producers and workers are paid fairly, the economy of developing countries is strengthened, better health of the population, poverty is reduced	Labels can also be faked
Child labor can be prevented by control and children can go to school	Production is more expensive
Interesting for environmentally conscious customers and image gain	In some cases, labels are awarded even if only a few or minimal requirements have been met
If applicable, organic farming is also supported	There is a large number of labels and it is not completely transparent for the consumer what the respective label stands for
Security for producers through price and purchase guarantees (less dependence on fluctuating world market prices)	

6. A primary requirement of 1,000 wooden toys is determined. Calculate the gross demand for materials (secondary demand)[5]:

Materials	**Plate**	**Rack**	**Bracket**	**Screws**
Quantity	1.000	1.000	4.000	16.000

7. In the next step, Mr. Heys determines the net requirement of materials. In doing so, it is important to consider the available inventory. Clarify the connection with the net demand calculation for the following items:

	Explanation
Available stock	This is the material that is still available in stock
Reservation for other orders	These are materials that are already reserved for other orders and cannot be used for the production of our order
Additional demand	This is the need that arises due to the fact that materials can break during production
Backorders	Orders have already been placed and are instantly expected

[5] information below

8. Calculate the net amount of materials needed for the wooden toy *Carrot harvest on the farm*.

Materials	Plate	Rack	Bracket	Screws
Gross requirements	1.000	1.000	4.000	16.000
- Available stock	**500**	**0**	**5.000**	**40.000**
+ Reservation for other orders	**400**	**0**	**4.500**	**20.000**
+ Additional requirements	**10**	**10**	**40**	**160**
- backorders	**600**	**0**	**0**	**10.000**
= Net requirements	**310**	**1.010**	**3.540**	**0**

9. You are asked to prepare a training on the procedures of procurement for the employees in *Weltladen*. For this, you will prepare an overview with advantages and disadvantages of the procedures[6].

Order point procedure	
Definition: Stock level (reorder point) initiates the purchase order - different order times - same order quantity (e.g. optimal order quantity)	
Advantages of this method:	Disadvantages of this method:
- Production readiness usually guaranteed - Lower minimum stock levels possible due to constant inventory control	Constant inventory control required

Ordering rhythm procedure	
Definition: Fixed dates initiate the order - same order dates - different order quantities (depending on consumption)	
Advantages of this method:	Disadvantages of this method:
Control effort is low	Danger of too high or too low inventories Higher minimum stock levels required

[6] information below

Just-in-time procedure	
Definition: - All goods are to be provided at the exact time at the place where there is a need for them. - No stock procurement	
Advantages of this method:	Disadvantages of this method:
- shorter storage time, i.e. lower storage costs - lower capital commitment	- dependencies between buyers and suppliers - coordination of production and delivery schedules - costly exchange of information - environmental impact due to frequent transports - minimum quantity may not be purchased - higher transport costs

10. Determine what basic preliminary considerations need to be made in order to decide whether the wooden toy should be outsourced or homemade.

For example:
Do we need another machine?
Which option is cheaper?
Do we need additional employees for production?

11. Determine for the following values whether in-house production or external procurement of the wooden toys is more cost-effective. A requirement of 1,000 pieces is assumed. The discount is to be fully utilized.

External purchase	
List price of the wooden toy	7.00 €
Supplier discount 5 %	0.35 €
Purchase price	6.65 €

In-house production	
Variable costs	4.15 €
Material costs per piece	2.05 €
Labor costs per piece	2.10 €
Fixed costs	
Machine costs	2.000.00 €

Quantity in units	Costs of in-house production in €	Unit costs of in-house production in €	Costs of external procurement in €
100	2.415	24.15	665
200	2.830	14.15	1.330
300	3.245	10.82	1.995
400	3.660	9.15	2.660
500	4.075	8.15	3.325
600	4.490	7.48	3.990
700	4.905	7.01	4.655
800	5.320	6.65	5.320
900	5.735	6.37	5.985
1.000	6.150	6.15	6.650
1.200	6.980	5.82	7.980
1.300	7.395	5.69	8.645
1.400	7.810	5.58	9.310

➔ The critical quantity is _800_ units