Job Market Signaling

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Standards and Benchmarks (see page 15)

Lesson Description

In this lesson, students participate in a classroom activity that introduces the concept of job market signaling—the idea that educational attainment can serve as a signal of expected productivity to employers when actual productivity is difficult to observe before hiring. Students explore relationships among education, productivity, wages, and employment. In the activity, some students act as job seekers with different productivity levels, while other students act as employers trying to hire productive workers. Throughout the simulation, students see how productivity affects wages and how education credentials can influence hiring decisions in labor markets. Students also consider how education and training can build human capital and affect future earnings and employment opportunities.

Grade Level

9-12, college

Concepts

Human capital
Income
Labor markets
Productivity

Objectives

Students will be able to

- explain how education and training can develop human capital and affect employment and earnings,
- explain how productivity is related to wages, and
- demonstrate how education credentials signal expected productivity to prospective employers.

Compelling Question

How do workers signal their expected productivity to prospective employers?

Time Required

30-40 minutes

Materials

- PowerPoint slide deck
- Handouts 1a and 2a, each cut apart
- Handouts 1b and 2b, three copies of each
- Handout 3, one copy for each student
- Handout 3 Answer Key, one copy for the teacher
- Security envelopes, one for each card from Handout 1a

Preparation

Cut apart Handouts 1a and 2a. Seal each card from Handout 1a in a security envelope. In Round 1, each job seeker will get an envelope with a card from Handout 1a. In Round 2, each job seeker will receive a card from Handout 2a. NOTE: There are 16 cards provided on each of the handouts. If you have a larger or smaller class size, remove or duplicate cards proportionally so that the relative distribution of low-, middle-, and high-productivity workers remains similar.

Procedure

1. Begin the lesson by discussing the following:
   - How do employers find employees for their business? (*They post a job opening on their company website or with an employee agency*.)
   - What characteristics are employers looking for? (*Employers look for workers that are honest, hard-working, and on time*.)

2. Display slide 2. Explain that like most markets, the **labor market** is made up of buyers and sellers. Discuss the following:
   - Who are the buyers in the labor market? (*Employers*)
   - Who are the sellers in the labor market? (*Employees*)
   - What is the price in the labor market? (*Wages*)

3. Explain that wages are the largest part of **income** for most people. Define income as payment people receive for providing resources in the marketplace. When people work, they provide human resources (labor) and in exchange they receive income in the form of wages or salaries. Discuss the following:
    - Why would someone want to invest in their education? (*Answers will vary. Students may say to work a higher-paying job after school.*)
    - How do employers know if they are hiring a productive employee? (*Answers will vary. Students may say they don't know, but employers are trying to gain information through reviewing resumes, conducting interviews, and checking references.*)
    - How do firms earn profits? (*By selling goods and services at a price higher than the cost of production*)
    - Why is it important to have productive workers? (*The more goods and services the employees produce, the more the business can sell, which results in higher revenues and profits.*)

4. Display slide 3. Define **productivity** as the ratio of output per worker per unit of time, then explain the relationship among productivity, revenue, wages, and profit. Ask students, "Can employers 'see' the productivity of job seekers before they hire?" (*No*)

5. Explain to students that they are going to participate in a simulation of the labor market, where some students will act as employers (buyers of labor) and others will act as job seekers (sellers of labor). In this simulation, the class will assume that labor is the only cost of production and that a worker's productivity determines how much revenue the worker generates for the firm. (OPTIONAL: Offer an incentive such as extra credit, a hall pass, or candy to the employer who earns the highest profit in each round and to the job seeker who earns the highest wage in each round.)

Round 1

6. Display slide 4 and review the following rules:
    - Job seekers may speak with more than one employer before accepting a job.
    - Employers may make offers to multiple job seekers.
    - Once a job seeker agrees to work for an employer at a stated wage, the match is final for that round.
    - Each job seeker may accept only one job.
    - Any unmatched job seekers at the end of the round will remain unemployed for that round.

7. Display slide 5. Divide the class into two student groups: Three students are employers, and the rest are job seekers. Discuss the following:
    - Tell employers they are buyers in the labor market. Explain that they are buying the labor of workers and that the price they pay is wages.

- Ask employers, "As a buyer, do you want to pay a high or low wage?" (*Answers will vary. Students will likely say they prefer to pay a low wage.*)
- Tell job seekers they are sellers in the labor market. Explain that they are selling their labor in exchange for wages.
- Ask job seekers, "As a seller, do you want a high or low wage?" (*Students will undoubtedly say they want high wages.*)

8. Distribute one sealed envelope containing a card from *Handout 1a: Round 1 Cards* to each job seeker. Tell employers and job seekers that these envelopes must remain sealed in Round 1 and that they will be negotiating wages. Review the following:
   - Explain to employers that they should be willing to pay a wage for labor that reflects the employee's ability to produce goods. Provide the following examples:
     - If a worker creates $23 worth of extra revenue for the firm, employers would be willing to pay *up to* $23 for that employee's labor.
     - If a worker creates $7 worth of extra revenue for the firm, employers would be willing to pay *up to* $7 for that employee's labor.
     - Explain that employers will compare the wage they pay with the revenue a worker is expected to generate; the difference between the two is profit.
     - Remind employers that they are buyers in the labor market and, like most buyers, should prefer to pay a low price (wage). In fact, employers earn a profit if they can hire employees who agree to work at a wage that is less than the extra revenue their labor produces.
   - Explain to job seekers that they should negotiate a higher wage because it will give the worker more money to buy goods and services.
   - Tell students that in Round 1, employers do not know each worker's productivity, so they must make decisions with limited information.

9. Tell employers they can hire any number of employees, but they will earn the highest profits if they are able to hire the most-productive workers from the group of prospective employees. They can pay from $7 (minimum) to $23 (maximum) per hour. Distribute a copy of *Handout 1b: Round 1 Employer Worksheet* to each employer. Tell them that as they hire each employee, they should assign the worker an employee number and record the agreed-upon wage in one row of the handout.

10. Tell job seekers that the productivity of workers varies greatly but that employers have no information about worker productivity.

11. Give job seekers and employers two minutes to negotiate wages. Remind students that job seekers are trying to get hired at the highest wage possible, while employers are trying to hire workers at wages low enough to earn a profit. NOTE TO TEACHER:

- Because employers do not know worker productivity in Round 1, they will likely offer many job seekers similar wages.
- Some employers may offer relatively low wages because they are uncertain whether a worker will generate enough revenue to justify a higher wage.
- Some job seekers may remain unmatched at the end of the round. In this simulation, those unmatched job seekers represent unemployment in the labor market.

12. After two minutes have passed, signal to students that Round 1 has ended. Tell job seekers to open their envelopes and reveal their productivity numbers to the employer who hired them.

13. Tell employers to complete Handout 1b by entering each worker's productivity, the agreed-upon wage, and the resulting net revenue (profit). They should then calculate the total profit. Some employers may earn profits and others may experience losses, depending on the wages they agreed to pay and the productivity of the workers they hired. This helps illustrate that employers benefit when wages are lower than the revenue workers generate and that imperfect information can lead to overpaying some workers and underpaying others.

14. Tell students that knowing information regarding worker productivity will be useful (for both sides) in the negotiation strategies in Round 2. If you offered incentives such as extra credit or candy, pay out the Round 1 prizes at this point.

15. Ask job seekers, "Was anyone left without a job?" (*Some students will raise their hand.*)

16. Display slide 6. Explain that the Bureau of Labor Statistics (BLS) defines a person as unemployed if they are over age 16, not institutionalized, not currently employed, and actively seeking work. In this simulation, students who wanted a job at the going wage but did not find one represent unemployment in the labor market.

17. Ask students, "What made Round 1 difficult for employers and job seekers?" (*Answer will vary.*)

18. Briefly discuss how incomplete information made it harder to match wages to productivity. Then explain that Round 2 will introduce a signal that may reduce that uncertainty.

Round 2

19. Tell students that they will now repeat the labor market simulation, but this time employers will have access to an observable signal that may help them estimate worker productivity before hiring.

20. Randomly distribute one card from *Handout 2a: Round 2 Cards* to each job seeker. These cards include one of the following labels: DO, HS, AA, BA, or MA. Review the following:

- Tell students that these labels provide information about worker productivity that employers may use when making hiring decisions.
- Tell job seekers that they will hold their cards with their fingers covering everything, except the two-letter code at the top of the card.

21. Distribute a copy of *Handout 2b: Round 2 Employer Worksheet* to each employer and give them time to review the credential key and discuss what each signal might imply about worker productivity. Remind employers that education credentials do not guarantee productivity in every real-world case, but employers may use them as a signal when they lack complete information. Also remind employers that they must still consider the relationship between wages, productivity, and profit.

22. Display slide 7 and review the following:
    - Employers will have two minutes to hire job seekers.
    - Employers should bid for employees within a range of $7 to $23.
    - Some job seekers will be unemployed.

23. Begin Round 2. NOTE: Job seekers with "DO" cards produce only one widget, earning $5 of revenue for the firm. Because the minimum wage is $7, employers will generally choose not to hire these workers. Job seekers with an MA card can produce six widgets, or $30 of revenue for the firm. If the maximum wage paid is $23, the employer can still earn a profit of $7 on that worker.

24. After two minutes, signal to students that Round 2 has ended. Instruct employers to use the information from each job seeker's card to complete Handout 2b. The employer should enter information about each employee's production (number of units produced) and the agreed-upon wage. Then, employers can calculate net revenue (profit). Employers with a more highly skilled workforce will experience more profits while others might experience losses.

25. Ask employers, "What information was useful in the hiring decision?" (*Employers will say that knowing each job seeker's education signal was helpful.*)

26. Ask job seekers, "Did knowing your education signal help you negotiate?" (*Answers will vary.*)

27. Review the following:
    - Employers paid higher wages to their employees in Round 2 and earned more profits.
    - Employees earned higher wages in Round 2 even as some were left unemployed.

28. Display slide 8. Introduce the concept of **human capital** so that students understand why education might affect productivity. Define human capital as the knowledge and skills that people obtain through education, experience, and training.

29. Explain that in this simulation, employers used education credentials as signals of expected productivity. Review the meaning of the codes DO, HS, AA, BA, and MA, telling students that the code indicates the level of education each worker has attained.

    DO = High school dropout

    HS = High school diploma

    AA = Associate's degree

    BA = Bachelor's degree

    MA = Master's degree

30. Display slide 9 and discuss the following:

    - Why did cards with higher levels of education have higher productivity numbers in this simulation? (*Higher levels of education and training were assigned higher productivity levels to show how employers may use credentials as signals of expected productivity*.)
    - Why did employers want to hire jobs seekers with higher productivity? *(Workers with higher productivity produce more goods and services, which can be sold; this results in higher revenue and profits.*)
    - Why did some job seekers not secure employment? (*Employers were looking for job seekers with higher productivity.*)
    - What might improve a job seeker's chances of earning a higher wage? (*Investing in their human capital through education or training*)

31. Display slide 10 with the FRED® graph, Differences in Unemployment by Education. Discuss the following:

    - The blue line represents the unemployment rate of those with just a high school diploma.
    - The red line represents the unemployment rate of those with a bachelor's degree.
    - Ask students, "How are levels of education associated with unemployment rates?" *(Lower levels of education are associated with higher unemployment rates and vice versa.*)

32. Display slide 11 with the BLS chart, Earnings and Unemployment Rates by Educational Attainment, 2024. Ask students, "How do the data connect to what happened in the simulation?" (*Job seekers with more education earned higher wages and had an easier time finding a job. Those with lower education earned lower wages and, in some cases, couldn't find a job.*)

33. Display slide 12 and discuss the following:

    - Why were the wages offered in Round 2 more varied (and higher) than in Round 1? (*In Round 1, employers lacked information about job seekers, so they paid all job seekers a low wage. In Round 2, employers had better information, so they paid job seekers a wage that better reflected their productivity.*)

- Why might education credentials matter to job seekers in the labor market? (*Education credentials may improve the likelihood of gaining employment and may help employers estimate a worker's expected productivity*.)
- Why were employers more likely to hire job seekers with higher education credentials in Round 2? Why was that signal useful? (*Employers used the credential as information about expected productivity. Better information helped employers offer wages that more closely matched expected productivity and reduced the uncertainty they faced in Round 1*.)
- Why were some job seekers not hired even when they wanted a job? (*Their expected productivity was below the minimum wage, so hiring them would create a loss for employers*.)

Assessment

34. Distribute a copy of *Handout 3: Assessment* to each student and allow time for students to work. Use *Handout 3: Assessment—Answer Key* to check their work.

Handout 1a: Round 1 Cards

Cut and separate, then place one card in a security envelope and seal.

1 I can produce 1 widget per hour, which is valued at $5 each. I generate $5 of revenue per hour for my employer.	**1** I can produce 1 widget per hour, which is valued at $5 each. I generate $5 of revenue per hour for my employer.	**1** I can produce 1 widget per hour, which is valued at $5 each. I generate $5 of revenue per hour for my employer.	**2** I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer.
2 I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer.	**2** I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer.	**2** I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer..	**4** I can produce 4 widgets per hour, which are valued at $5 each. I generate $20 of revenue per hour for my employer.
4 I can produce 4 widgets per hour, which are valued at $5 each. I generate $20 of revenue per hour for my employer.	**4** I can produce 4 widgets per hour, which are valued at $5 each. I generate $20 of revenue per hour for my employer.	**5** I can produce 5 widgets per hour, which are valued at $5 each. I generate $25 of revenue per hour for my employer.	**5** I can produce 5 widgets per hour, which are valued at $5 each. I generate $25 of revenue per hour for my employer.
5 I can produce 5 widgets per hour, which are valued at $5 each. I generate $25 of revenue per hour for my employer.	**6** I can produce 6 widgets per hour, which are valued at $5 each. I generate $30 of revenue per hour for my employer.	**6** I can produce 6 widgets per hour, which are valued at $5 each. I generate $30 of revenue per hour for my employer.	**6** I can produce 6 widgets per hour, which are valued at $5 each. I generate $30 of revenue per hour for my employer..

Handout 1b: Round 1 Employer Worksheet

Employee number	Extra units produced x Price per unit = Revenue earned	Wage paid	Net revenue (profit)
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
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	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	Total revenue = ____________________	$	$

Handout 2a: Round 2 Cards

Cut and separate, then place one card in a security envelope and seal.

DO I can produce 1 widget per hour, which is valued at $5 each. I generate $5 of revenue per hour for my employer.	**DO** I can produce 1 widget per hour, which is valued at $5 each. I generate $5 of revenue per hour for my employer.	**DO** I can produce 1 widget per hour, which is valued at $5 each. I generate $5 of revenue per hour for my employer.	**HS** I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer.
HS I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer.	**HS** I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer.	**HS** I can produce 2 widgets per hour, which are valued at $5 each. I generate $10 of revenue per hour for my employer..	**AA** I can produce 4 widgets per hour, which are valued at $5 each. I generate $20 of revenue per hour for my employer.
AA I can produce 4 widgets per hour, which are valued at $5 each. I generate $20 of revenue per hour for my employer.	**AA** I can produce 4 widgets per hour, which are valued at $5 each. I generate $20 of revenue per hour for my employer.	**BA** I can produce 5 widgets per hour, which are valued at $5 each. I generate $25 of revenue per hour for my employer.	**BA** I can produce 5 widgets per hour, which are valued at $5 each. I generate $25 of revenue per hour for my employer.
BA I can produce 5 widgets per hour, which are valued at $5 each. I generate $25 of revenue per hour for my employer.	**MA** I can produce 6 widgets per hour, which are valued at $5 each. I generate $30 of revenue per hour for my employer.	**MA** I can produce 6 widgets per hour, which are valued at $5 each. I generate $30 of revenue per hour for my employer.	**MA** I can produce 6 widgets per hour, which are valued at $5 each. I generate $30 of revenue per hour for my employer..

Handout 2b: Round 2 Employer Worksheet

Credential Key

Productivity Round 1 = Numbers Round 2 = Letters	**Extra units produced**	**Price per unit**	**Revenue earned**
1 = DO	1	$5	$5
2 = HS	2	$5	$10
4 = AA	4	$5	$20
5 = BA	5	$5	$25
6 = MA	6	$5	$30

Employer Worksheet

Employee productivity code	**Extra units produced x Price per unit = Revenue earned**	**Wage paid**	**Net revenue (profit)**
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
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	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	________ x $5 = ____________________	$	$
	Total revenue = ____________________	$	$

Handout 3: Assessment

Answer the questions below.

1. In the simulation, why were employers willing to offer higher wages to more-productive workers? Use evidence from the activity in your answer.

2. Explain how education credentials can act as a signal in the labor market.

3. Describe one way education or training can build human capital and affect a person's future earnings or employment opportunities.

4. In the simulation, one worker could produce 2 widgets per hour and another could produce 5 widgets per hour. If each widget sells for $5, how much revenue does each worker generate for the employer per hour? Which worker would an employer likely be willing to pay a higher wage to, and why?

Handout 3: Assessment—Answer Key

1. In the simulation, why were employers willing to offer higher wages to more-productive workers? Use evidence from the activity in your answer.

   Employers were willing to offer higher wages to more-productive workers because those workers generated more revenue for the firm. In the simulation, workers who could produce more widgets per hour earned more money for the employer, so the employer could pay them a higher wage and still make a profit. This was especially clear in Round 2, when employers had more information and were more likely to negotiate higher wages with workers who were expected to be more productive.

2. Explain how education credentials can act as a signal in the labor market.

   Education credentials can act as a signal by giving employers information about a worker's expected productivity when they cannot directly observe productivity before hiring. In the labor market, employers may use degrees, diplomas, or other credentials as clues about a worker's skills, knowledge, training, or level of preparation. This signal can influence hiring decisions and wage offers.

3. Describe one way education or training can build human capital and affect a person's future earnings or employment opportunities.

   Education or training can build human capital by helping people gain knowledge, skills, and experience that make them more productive. For example, learning technical skills, improving communication, or earning a certification can make a worker more valuable to employers.

4. In the simulation, one worker could produce 2 widgets per hour and another could produce 5 widgets per hour. If each widget sells for $5, how much revenue does each worker generate for the employer per hour? Which worker would an employer likely be willing to pay a higher wage to, and why?

   The worker who produces 2 widgets per hour generates $10 per hour in revenue.

   The worker who produces 5 widgets per hour generates $25 per hour in revenue.

   An employer would likely be willing to pay the worker who produces 5 widgets per hour a higher wage because that worker generates more revenue for the firm. Since the worker adds more value, the employer can offer a higher wage and still earn a profit.

Standards and Benchmarks

National Content Standards in K-12 Economics

Standard 8: Labor and Income

Income for most people is determined by the market value of their labor and other productive resources they sell. A worker's wage depends on their productivity and the price of the product they produce. Many factors affect the distribution of income in an economy, including differences in educational levels, experience, and career choices, as well as discrimination and government policies.

Benchmarks

8.M.2: Employers are willing to pay wages and salaries to workers because they sell the goods and services that those workers produce at prices high enough to cover all costs of production, including wages and salaries.

8.M.3: Worker productivity is a key determinant of a worker's value to an employer. More productive workers produce more output and therefore can ask for higher wages compared to less productive workers.

8.M.5: People's incomes are influenced by the choices they make about education, training, skill development, careers, and other things that impact their productivity. People with lower levels of education and skills face fewer employment options and reduced earnings potential.