



# **What Makes Employees Productive and Have High Performance? Human Capital Investment in Universities**

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Author FN designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author ECSP managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/AJESS/2020/V11i1130281

### Editor(s):

(1) Dr. Velan Kunjuraman, Universiti Malaysia Kelantan (UMK), Malaysia.

### Reviewers:

(1) Richa Aryan, Chandigarh University, India.

(2) Preeti Singh, Birla Institute of Management, India.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/60925>

**Original Research Article**

**Received 02 July 2020**

**Accepted 06 September 2020**

**Published 18 September 2020**

## **ABSTRACT**

The study describes the evaluation results concerning the improvement of the education levels among the employees of a university in Indonesia by making an investment in education. The study is aimed at investigating the employees' productivity and performance after making an investment in education. This study with evaluation method using discrepancy model. The sample of the study consisted of 255 non-academic university employees. Data were collected by way of a questionnaire on Guttman scale. The questionnaire was validated by using logical and empirical validation by a Pearson correlation technique and reliability by KR-20 technique. The data analysis with descriptive. To calculate the capital human investment, the human capital investment formula was used for finding payback period, benefit/cost ration, return-on-investment, net-present-value, and internal-rate-of-return. The results of the study showed that the employees who made human capital investment in education were able to increase their productivity and performance as their insights, knowledge, and skills improved. The research findings were able to give insights to leaders in high-level institutions or government institutions that investing in education is truly essential, needs more attention, and needs to be done by employees.

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*Keywords: Human capital investment; employees; productivity; performance; universities; Indonesia.*

## 1. INTRODUCTION

Changes and advances in technology require human resources to have more capabilities. Developing countries risk being further marginalised in the competitive world if their education systems are not adequately prepared for advanced human capital [1]. In addition, that situation makes human resources need more support from many parties in order to be able to compete freely through education [2]. Investment in knowledge is theoretically supported to improve human development [3]. Investment in education and the rate of human capital formation was identified early on as a key factor for influencing performance growth [4]. Education inequality manipulates the quality of the human capital stock of the country with effect on living standards, growth, and productivity [5,6]. To the extent that this trend becomes more widespread, it has the potential to raise the level of human resources in university, thereby improving the average standard of living and level of human development [7].

Investing in human resources is one of the ways to cultivate knowledge, skills, and attitudes at University. It aims to buy an asset that is expected to be resold again with a higher value in the future through given services in the form of productivity and performance. Investing can also be meant as delaying consuming at the present to be used in a future consumption [8]. Employees can make an investment in non-physical aspects such as joining education and training both independently and provided by the workplace [9,10].

Some factors influence the need to improve the education levels of the employees in the University. These factors include the need to access higher levels of education, to widen the employees' knowledge, to sharpen the employees' skills in order to fit the development of science and technology, and to enhance the employees' rationality at work. Education enables employees to learn technical knowledge which can be used for leadership, modern management, and other modern activities [11]. Obtaining new knowledge encourages people to make invention in public services, engineering, economics, and various other aspects.

It cannot be denied that the existence of employees in an organization is important and related to innovation [12]. The final achievement

of obtaining education is improving not only employees' productivity and performance, but also individuals' capability and motivation, the organization climates, leadership, and workgroup effectiveness [13]. These elements encourage an institution to take a better care of its employees. Human capital is essential as knowledge in human resource can support productivity improvement [14,15].

Educational investment management is an indirect relationship between educational processes and the benefits of education [16]. Improving the quality of human capital investment takes a long time [17]. It needs the calculation of rates of return from human capital investment [18]. The employees of University, Indonesia, who are eager to make an investment in education, should analyze the cost benefits. The cost includes one that is used to continue to a higher level of education and the opportunity cost. The opportunity cost is the income obtained if the employees do not continue to study. The benefit obtained by employees who continue to study is that their income would increase after completing the study [19].

Studies on measuring human capital investment and rates of return for the employees of University who continue their study to a higher level of education have never been done. Therefore, it is important to conduct an analysis to measure the human capital investment for the university employees who intend to continue their education.

Five research questions are proposed in this study to provide distinct explanation about the research problems. These questions are related to the aspect of human capital investment (HCI) as a factor that is considered to contribute to increasing income in the perspective of education for university employees. The questions are formulated as follows:

1. How does the period of time calculated show the period of return of an education investment (payback period)?
2. How are benefits and costs compared in improving education qualifications?
3. How is return on investment identified in an educational perspective?
4. What is the ratio between the present value of investment and the present value of income (net present value)?
5. How is the cost of capital compared?

## 2. THEORETICAL REVIEWS

### 2.1 Employees Productivity

Some statements related to the concept of productivity have been proposed by theorists. One states that productivity is an important component in organization [20]. Productivity attempts to value the improved employee outcome [21]. Employee productivity is defined as the ratio of real inputs and outputs [22]. In general, productivity is the comparison between output and input [23]. The employee's productivity has a significant role for the success of organizations [24]. By increasing productivity, it can indirectly provide excellent services for the organizations' stakeholders [25].

Productivity has been seriously underestimated by employees [26]. Most employees do not pay attention to productivity because they consider the productivity of work as an economic motive to obtain maximum profit from a business related to goods production. [27] state "every employee's should have a value that is productivity". By having this value, employees can contribute themselves to the institutions [28]. More-contemporary-authors-have reasoned, therefore, that management should be able to hold employees financially liable under most of any instances of under-productivity.

Employee's productivity includes factors that have a direct impact on productivity such as absenteeism, intention to stay in the organization, and employee's performance [29]. The characteristics of productive employees include having confidence, having high sense of responsibility, loving his jobs, being visionary, able to complete the work in accordance with the task and function and able to solve existing problems, having good adaptation to a changing environment, giving good and positive contribution to the institution, and having power to demonstrate his potential in the workplace [30,31,32,33].

### 2.2 Employees Performance

Performance is a tool that is being used effectively for productivity [34]. Performance consists in improving the efficiency and quality of a public service [35]. Every employee is required to give positive contribution through excellent performance. [36] state that the organization's performance depends on the employee's performance. [37] also states that performance is

the final result of work achieved by the employees when doing their jobs according to certain criteria that apply to the job.

Generally, performance is a combination of ability, effort, and opportunity as a result of quality and quantity achieved by the employees [38]. [39] also asserts that performance is "the record of outcome produced on a characteristic job function or activity during a specified time period". [40] states that "the employees' performances are influenced by extrinsic-intrinsic factors". One of the intrinsic factors is education. Other intrinsic factors are experience, motivation, health, age, skill, emotion, and spirituality. Meanwhile, the extrinsic factors are any external things that can influence the employees such as physical and non-physical environment, leadership, good communication with colleagues and superiors, competency, facility, workload, working procedure, and existing system in a workplace. [41] states that performance is the quality of employees who are task-oriented and job-oriented.

Employees performance can be measured through performance parameter [42]. This can be done, for example, by looking at the employees' quality of work achieved based on certain requirements and high readiness, the accuracy in the completion of work, having initiative (self awareness) to carry out the tasks and responsibilities without depending on leaders, having skills that can be developed, and having good communication [43].

### 2.3 Human Capital

Human capital is an essential element for an organization [44]. If a person employs his ability maximally, he can give excellent performance [45]. Human capital is the what and how to know the skills and capabilities of employees in organization [46]. Human capital depicts human's competency in working [47]. Human capital is an important factor in organizations as it gives big contribution to the improvement and development of organizations [48]. [49] also assert that "human capital is the capabilities, skill, and knowledge of employees that have economic values to an organization.

Human capital is human's nature that always exists in an individual's lifetime in the form of attitudes, knowledge, and skills [50]. This capital will be used as a basis for self-management and it can also help individual in managing himself

when involving in organizations. Attitudes, knowledge and skills will give positive contribution to performance and organizations' productivity.

There is a need to empower human capital at the present due to the competitive pressure and the rapid changes marked by new processes and technologies. Besides, empowering human capital is important to make the organizations survive and able to adapt with the changing era. Leaders believe that employees with attitudes, knowledge, and skills would be able to give significant performance and productivity for the organization. Human capital is the source of innovation obtained from brainstorming. Brainstorming can be achieved from research, reengineering process, training and education, and organizational management [51].

Human capital can give additional values for organizations through the employees' motivation, commitment, competence, and effectiveness of work when they work as individuals or within a team [52]. The additional value for the organizations is related to the competence development. According to [53], human capital depicts the human productive capacity. It is the combination of knowledge, innovation, and capability of an individual to do jobs so that he can create values to achieve goals. The contribution of human resources is the ability to give additional value in human's jobs so that it can give a sustainable revenue to the organizations in the future.

Human is the only one resource that is competitive [54] Human has the know-how, abilities, and skills divided into competence, attitudes, intellectual intelligence, intuition, and experience. Human also has story, understanding, the result of a learning process, undocumented method, and the result of market research. A major assumption behind human capital is the individual's decision to improve his

attitudes, knowledge, and skills through education and training [55]. The accumulation of human capital will improve the employees' performance and productivity, innovation in technology, return to capital, and sustainable development. At the macro level, human capital accumulation improves employees' productivity and performances, facilitates technological innovation, improves return to capital, creates sustainable growth, and in turn supports poverty alleviation. Meanwhile, at the micro level, human capital built through training and education potentially increases the capacity of employees in the organization both in position and income.

Human capital is classified into human capital in general (for example formal education and prior managerial experience) and specific human capital (e.g.firm specific training and employees' knowledge about customers, products, and services). [56] state that even though human capital gives a positive correlation, it is more likely an indirect indicator of education and work experience while direct indicators are attitudes, knowledge, competencies, and skills. The indicator specifications by Unger can be seen in Table 1.

## 2.4 Investment in Education

Investment in education is an investment of human capital in the form of time and cost [57]. Education is considered as an important investment in human capital [58]. It aims to give additional values for the employees. Investment enables employees to keep improving their capacity. The examples of human capital investment are investment in training and development, practices for improved retention, and in-job secure work forces [59]. Investment in education facilitates the employees to improve their knowledge. Most people forget that they have intelligence as an initial capital that can be developed as capability.

**Table 1. Human capital operational**

<b>Human capital investment indicator</b>	<b>Outcomes-of-human capital-investment</b>	<b>Success parameter</b>
1. Task-related of human capital <ul style="list-style-type: none"> <li>• Star-up Experiences</li> <li>• Managerial Experiences</li> </ul>	Skill Attitude Competence	Productivity Performance Excellent Service
2. Nontask-related of human capital <ul style="list-style-type: none"> <li>• Education</li> <li>• Work Experience</li> </ul>	Knowledge	

Source: Unger et al. (2009)

Investment in organizations is classified into an intangible resource [60]. It is important for employees or organizations to make an investment to develop their organizations. Investment in education means cultivating knowledge so that employees can improve their human capital capacity. It is the scarification at the present to get additional values in the future. Investment in education has many functions, [61] states "if wages reflect productivity, then more and more people want to be a highly educated person, it makes productivity higher and improve performance."

Investment in education in the social function of humanity refers to the contribution of education to development [62]. Educated people are expected to have better understanding about their rights and obligations so that their insights and behaviors are more democratic. Investment in education means creating a good mindset and improving knowledge. Knowledge is a crucial organizational resource that continuously improves to be a competitive and precious resource. Therefore, organizations should have an attempt to change the form of the employees' accumulation of knowledge into assets or organization prices. Education is an investment to influence the productivity and organizational performance.

As an investment, education is a key requirement in development sectors especially organizations [63]. Investment in education can support the economic growth through improving the skills and production capabilities of employees. Developing human resources in an organization is a foundation of prosperity and effective use of a physical capital resource [64].

### 3. METHODS

#### 3.1 Research Design

This study was research in evaluation using the quantitative approach. The main reason for

choosing this design is because the study is able to measure the effectiveness of investment in education by collecting, analyzing, and reviewing the implementation. Then it formulates policies by first considering positive values and the benefits of investment education. The evaluation model was the discrepancy evaluation model developed by Malcolm Provus, and the stages of the evaluation were adapted from Fernandes. This evaluation model was used to propose a measure in assessing efficiency, effectiveness, and additional values as a result of the employee's intellectual ability by using the additional value approach through education. It was popularized by VAIC™ (Value Added Intellectual Coefficient).

#### 3.2 Population and Sampling

The population of the study consisted of all the university non-academic employees totalling to 950 people. The reason for choosing the university non academic employees was that the results of the study could be applied directly to the benefits of University. Sampling technique was the probability sampling with simple random sampling by using Nomogram Herry King formula with an error rate of 5%. There were 255 employees as respondents.

#### 3.3 Instrument

The study used an instrument inventory type consisting of a questionnaire with questions or statemens. This instruments was espected to gather primary information related to human capital investment. The instruments was develop using the following Table 2 of specification.

The questionnaire was used a closed-type inventory with five response alternatives (Likert Scale). Respondents selected one of the five alternatives using a check mark.

**Table 2. Table of specifications by aspects and number of items before and after tryout**

No	Aspects	Before tryout		After tryout	
		Number	Total	Number	Total
1.	Payback Period	1-14	14	1-14	14
2.	B/C Ratio	15-30	16	15-27	13
3.	Return on Investment	31-34	4	31-34	4
4.	Net Present Value	35-40	5	35-40	5
5.	Internal Rate of Return	41-45	5	41-44	4
Total			45		41

### 3.4 Validity and Reliability

Before the instrument was used, a trial was conducted to determine the level of validity and reliability of the instrument. The testing of the validity of the instrument was done in two ways, namely by expert validation (face validity or expert judgment) and content validation. The content validity was obtained by logical validity, that is, subjecting the instrument points to the experts' assessment (expert judgment).

Calculation of the coefficient of validity of the instrument used the formula for Product Moment correlation. The trial data were processed with the help of the SPSS computer program (Statistical Product and Service Solutions) version 21. The technique used to test the instrument validity is the Product Moment correlation technique with the formula:

$$r_{xy} = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{\{n \sum X^2 - (\sum X)^2\} \{n \sum Y^2 - (\sum Y)^2\}}}$$

Information:

- $r_{xy}$  = Correlation coefficient between variables X and Y
- N = Number of subjects/respondents
- SX = Number of item scores
- $SX^2$  = Number of squares of item scores
- $\sum Y$  = Total score
- $\sum Y^2$  = The total square of the total score
- $\sum XY$  = The number of item score multiplication and question score

The reliability estimation by expert judgment was carried out after the validity of each item was known. Calculation of the reliability measure used the Kuder-Richardson (KR20) formula since the instrument used a two-scale scoring system. Instruments that are good but valid must also be reliable. Instruments are said to be reliable if they provide a fixed result even if it is done by anyone and at any time. The formula is as follows:

$$r_{11} = \frac{k}{(k-1)} \left( \frac{V_t - \sum pq}{V_t} \right)$$

Information:

- $r_{11}$  : instrument reliability with KR<sub>20</sub>
- k : number of questions
- $V_t$  : total variance
- P : the proportion of correct answers on certain items
- q : proportion of wrong answers to certain items (  $q = 1 - p$  )

Formula  $S^2$  (Varians):

$$V = \left( \frac{\sum x^2 - (\sum X)/N}{N} \right)$$

Correlation coefficients are between 0 and 1. An instrument is reliable if the correlation coefficient is 0.6; the higher the correlation coefficient the more reliable the instrument, and vice versa. Thus if the Kuder-Richardson (KR20) test results are in the range  $\geq 0.6$  to 1, then it is declared reliable; if it is  $\leq 0.59$ , the instrument is declared unreliable.

### 3.5 Data Collection

Data collection was done by the questionnaire. It was used to find out data about employees' productivity, employees' earning (up to Senior High School or continuing to the university before working), *rate of return*, comparison between NPV positive and NPV negative, and analysis of *human capital feasibility*.

### 3.6 Data Analysis

Data were analyzed using the human capital investment formula. This was done by reducing the respondents' responses and categorizing them according to the pre-determined criteria. The *payback period analysis* (PP) shows how long (years) an investment returns. It shows the comparison between the initial investment and the annual cash flow. The formula is as follows:

$$\text{Payback Period} = \frac{\text{investment value}}{\text{proceed}}$$

If the annual cash flows are different annually, the following formula is used:

$$\text{Payback Period} = n + \frac{a - b}{c - b} \times 1 \text{ year}$$

Notes:

- n : Final year wherein cash flow is not able to cover initial investment
- a : Sum of initial investment
- b : Sum of cumulative cash flow of n<sup>th</sup> year
- c : Sum of cumulative cash flow of n+1

### 3.7 Finding B/C Ratio

The *B/C ratio* is the difference *output* addition and *input* addition. Net B/C is used to compare between NPV positive and NPV negative. The formula is as follows:

$$BCR = \frac{PV \text{ benefits}}{PV \text{ costs}}$$

Where:

PVbenefits : present value of benefits  
 PVcosts : present value of costs

Finding *Return on Investment* (ROI)

ROI refers to ratio of cash earned or lost on investment. ROI is commonly expressed in percentages. The ROI formula is:

$$ROI = \frac{(\text{Use Total} - \text{Cost Total})}{\text{Cost Total} \times 100\%}$$

If ROI is negative, investment is not to be considered as it is a loss. If ROI is positive, investment can be considered as gaining. Higher ROI is better than lower ROI. A project with the highest ROI has the highest profit.

### 3.8 Finding Net Present Value (NPV)

*Net present value* (NPV) is the difference between the cash received and the cash spent in consideration to the *time value of money*. The formula for *time value of money* is to know the present value of money. This is because the cash will be received in the future; the present value should be known. The formula for NPV is as follows:

$$NPV = \sum_{k=0}^n \frac{R_k - C_k}{(1+r)^k}$$

Notes:

$R_k$  : Revenue the  $k^{th}$  year  
 $C_k$  : Expenses in the  $k^{th}$  year  
 $r$  : Real interest rate  
 $k$  : Time period

To analyze the use of the *human capital* in elevating productivity, the *net present value* (NPV) is used:

$$Y(sla) = \sum_0^n \frac{V_t}{(1+r)^t}$$

Notes:

$Y(sla)$  : Present value (NPV) from life earning flow

$V_t$  : Amount of earning in  $t$  year  
 $r$  : *Discount* rate showing an individual's *time preference* on present goods consumption compared to future consumption  
 $t$  : Time period (length) of service

### 3.9 Finding Internal Rate of Return (IRR)

To find the IRR (education internal return), a *Microsoft Excel* software is used that is related to the following formula:

$$IRR = r1 + \frac{Y(sla)_1}{Y(sla)_1 - Y(sla)_2} \times (r2 - r1)$$

Notes:

$Y(sla)_1$  : Present value (NPV) of life earning flow with a higher education level  
 $Y(sla)_2$  : Present value (NPV) of life earning flow with a lower education level  
 $r$  : *Discount* rate referring to an individual's *time preference* on present goods consumption compared to future consumption

## 4. RESULTS AND DISCUSSION

The study is aimed at finding answers to the research questions related to (1) payback period, (2) B/C ration, (3) return on investment (ROI), (4) net present value (NPV), dan (5) internal rate of return (IRR) for non-academic employees who have continuing education.

### 4.1 Duration of Fee Return Used in Investment in Education (Payback Period)

Payback Period of investment in the perspective of education describes the length of time needed so that the funds embedded in an investment can be recovered entirely. The analysis of Payback Period that has been done to find out how long the new business can return the investment. The time specified in this evaluation is according to the study period of each education level being pursued.

In the Table 3 it can be explained that the calculation of the payback period is intended for employees who are currently pursuing an increase in education qualifications. With an investment of IDR 40,650,000.00, it can be returned within 1 year, 7 months, and 9 days. The faster the return time, the better the risk that

might occur. It means that the calculation of the payback period can be used as a risk consideration tool because the shorter the payback period, the shorter the risk of loss. This statement is emphasized by [65] stating that "payback period can be interpreted as the period of return of investment that has been spent, through the benefits obtained from a planned project". Based on the description, it can be said that the payback period of investment in the education perspective describes the length of time needed so that the funds embedded in the investment can be recovered entirely.

Payback Period (PP) formula

$$\text{Payback Period} = \frac{\text{IDR } 40,650,000}{\text{IDR } 25,140,000}$$

$$\text{Payback Period} = 1.616$$

Looking for month and day

Looking for month: (61% from 1 year)  $61 \times 12 / 100 = 7.32$  (7 month)

Looking for day:  $32 \times 30 / 100 = 9.6$  (9 days)

So, the time that is needed for payback period is 1 year, 7 months, and 9 days.

The concept of the payback period in human capital investment is a concept that is easier to deliver than it is to apply at the corporate level. The main premise of the human capital concept is that humans are not just resources but are also capitals that produce certain products. This is in accordance with [66] stating that "every expenditure made in order to develop the quality and quantity of capital is an investment activity."

Problems sometimes arise where the organization turns out to not get the expected rate of return. Every additional one school year means that additional education costs will result in an increase in work capacity and income level. An additional one year of schooling not only has

to increase expenses for increasing education personnel education qualifications, but it also means delaying income receipts (forgone earnings) for one year. This is in accordance with the human capital investment concept that is in the literature review. [67] states:

*Human capital analysis starts with the assumption that individuals decide on their education, training, medical care, and other additions to knowledge and health by weighing the benefits and costs. Benefits include cultural and other non monetary gains along with improvement in earnings and occupations, while costs usually depend mainly on the foregone value of the time spent on the investment.*

In this case, the human capital investment in the education perspective is indeed needed for employees, because it is clear that there are benefits that are obtained. Human capital investment is carried out with the aim of obtaining a higher level of consumption in the future, in addition to preparing education employees who are skilled and have a lot of knowledge so as to improve both the quality and quantity of the employees themselves.

The conclusion from the results of calculations that have been made with regard to the existing theories states that the payback period of the education employees has a return value that is no more than the standard time set based on the level of education taken by the education personnel. The results of calculations using the SPPS version 21 can be interpreted that the payback period for education personnel who invest in education has a value above the average of 83.69%. The percentage shows that from 205 respondents taken as the study sample, the majority have a return that does not exceed the time limitation so that the payback period for education personnel who invest in education has a positive value and can be well received and effective.

**Table 3. Payback period analysis**

Period	Cost/Investment	Revenue/Opp.Cost	Total
1	IDR 9,900,000.00	IDR (3,000,000.00)	IDR (3,000,000.00)
2	IDR 18,000,000.00	IDR (4,500,000.00)	IDR (7,500,000.00)
3	IDR 12,750,000.00	IDR (5,000,000.00)	IDR (12,500,000.00)
4		IDR 22,848,000.00	IDR 35,348,000.00
5		IDR 25,140,000.00	IDR 60,488,000.00
6		IDR 25,140,000.00	IDR 85,628,000.00
Total	IDR 40,650,000.00		



The effectiveness of the Payback Period is the return period of investment in education not exceeding the predetermined standard. The effectiveness of the time is not influenced by the level of education that is being followed by education personnel. For example, the education level is lower and the time in return is faster, but the effectiveness does not exceed the specified time.

Payback period analysis is carried out as an alternative in a shorter payback period. The use of the payback period in education is expected to obtain additional information to measure how quickly return on capital invested in the education sector can be obtained. The results of this payback period calculation provide information about the length of the project break-even carried out by education personnel in the investment sector of education. The payback period in education is used as a risk consideration tool because the shorter the payback period, the shorter the risk of loss.

#### **4.2 Benefit and Costs of Educational Investment (B/C Ratio – Benefit Cost Ratio)**

The result of calculating the investment benefits and costs of education is 1,48. The interview data revealed that an employees who had made an increase in educational qualifications could boost their names through the degree and knowledge that had been taken during the study. The benefits of increasing these educational qualifications are accumulated annually. In accordance with the criteria that if Net B/C is more than 1, investment in education provides net benefits and is feasible to do.

These results indicate that  $B/C \text{ Ratio} > 1$  and the effort / investment made by the employees is profitable or feasible. [68] states that benefit cost ratio is an assessment carried out to see the efficient level of cost usage in the form of a comparison of the number of positive net present values with a negative net present value (NPV), or in other words, Net B / C is the ratio between the positive NPV and a negative NPV and this shows a description of how many benefits will be obtained from the costs incurred.

Benefit cost ratio (B/C Ratio) is a method used to determine the amount of profits and losses of an investment in an educational perspective by calculating the costs incurred and the benefits obtained. Investment in education provides

significant benefits for employees who work at the university.

The feedback analysis using the human capital approach involves elements of cost and benefit. The nature of the return itself is the benefit or profit, which is calculated from incomes. Investment is seen as having an advantage if the benefit is greater than the cost or the ratio of  $B/C > 1.00$ . In the benefit/cost analysis, there are two elements that must be analyzed, namely direct costs and indirect costs. Direct costs are all costs incurred to attend education such as operational costs, books, and tools and other costs related to educational needs. Accommodation and consumption costs (living costs) are not calculated as much as the cost of education, because without any education every employee needs this fee. Indirect costs are often also referred to as opportunity costs, which are the value of the time spent during education. This is measured by the amount of income that will be received by employees if the time is used for work.

The conclusion that can be drawn from the results of B / C Ratio in benefit analysis is that the employees who participated in an additional one year of education could increase income by around 1.48% while the percentage of Benefit / Cost Ratio using SPSS version 21 was 77.56%, meaning that the benefits obtained by an education worker who invests in education can be well received. Earnings received are the results of increasing educational qualifications.

The results of the BCR analysis carried out above can determine the right choice and the budget can be allocated effectively. The selection of alternatives and determination of these priorities can contribute to the achievement of performance-based budgets, which is one of the pillars of a budget reform. The main analysis that must be put forward by university institutions is the extent of the contribution of investment in the field of education. Benefit / Cost Ratio can help use it to (a) assist in decision making processes; (b) add alternatives or choices; and (c) reduce the cost of ineffective alternatives.

#### **4.3 Percentage of Education Investment Returns (Return on Investment - ROI)**

Return on investment is a measure of performance that can be used to compare several investments, one of which is investment in education. ROI is calculated as investment net income divided by investment costs. [69] states

"this ratio shows what percentage of net income is obtained when measured by owner's capital." ROI analysis for employees who invest in education has a very important meaning as one of the comprehensive financial analysis techniques (comprehensive) ROI analysis is conducted to measure the effectiveness of investments made by employees [70].

Internal efficiency and external efficiency have very strong links. The external efficiency of education includes the rate of economic return and education investment in general, funding allocations for types and levels of education. If output refers to the internal goals of the education system, such as dropping out of school, repetition rates and achievement of curriculum objectives, the focus of the analysis will be on the internal efficiency of the education system itself. Both are aspects of the overall efficiency of the education system.

Mueser et al. [71] states that "the amount of return on investment will change if there is a change in profit margin or Asset Turn Over, either or both of them." By knowing the human capital return on investment, the organization can find out how much the ability of its education personnel makes a profit and how efficiently the organization uses human resources (employees), because the future of the organization is determined by the quality of the current employees.

The resulting findings are not just a simple explanation of the significance of the relationship, but they also reveal other evidence about the causes of the relationship. Such studies can also be used to measure the effect of education on ability, increased productivity, and increased labor wages.

Conceptual return on investment (ROI) includes income earned after employees carry out economic activities and earn income. Based on the human capital approach, income can be increased by education, meaning that every additional time (month/year) following education will have an impact on increasing income but, on the other hand, delaying income during the education (probable costs) and paying all tuition fees.

ROI analysis in education can use the human capital approach. This approach uses a method

whose main component is the salaries of the non-academica employees as a basis for analysis. There are theoretical income that is included in income not from non-labor income, such as inheritance, bank savings interest, and dividends. Labor income includes salary, performance allowances, and other benefits (finger benefits). In the perspective of the employment-educated economy, every education worker earns income from his work differently due to differences in the quality of employees, such as ability. Education has a significant influence on quality, especially the level of educational ability. Therefore, investment in education is one method to reduce income inequality.

The conclusion from the discussion above is that return on investment (ROI) is one form of profitability ratios that are intended to measure the ability of educational personnel with the overall funds invested in assets used for operational employees and obtained profits. The advantage that is generated from the employees is that there are changes in income, performance, productivity, and motivation of the employees at work.

The numbers generated in calculating return on investment in the educational perspective for employees can allow for appropriate decision making regarding the importance of education and training in solving human resource development problems. Implications of return on investment (ROI) in education for employees at the university can be as follows: (a) encouraging institutional leaders to pay attention to employees to increase qualifications in education; (b) encouraging cost efficiency; (c) reducing investment in excessive operating assets.

#### **4.4 Present Value Total (Investment) with Total Present Value of Net Present Value**

A net present value is obtained from calculating the difference between the present value of investment and the present value of net cash receipts in the future. The results of the analysis that has been carried out on  $df$  (discount factor) used in calculating the Net Present Value for employees who are conducting an education improvement refer to the Indonesian interest rate from Bank Indonesia which is 7.50%.

**Table 4. Net present value analysis (using IDR)**

Per	Cost/Investment	Revenue/ Opp.Cost	Df (7.50%)	PV-Investment	PV-Revenue
1	9,900,000.00	(3,000,000.00)	1,0000	9,900,000.00	(3,000,000.00)
2	18,000,000.00	(4,500,000.00)	0,9302	16,744,186.00	(2,790,600.00)
3	12,750,000.00	(5,000,000.00)	0,8653	11,023,991.00	(2,414,706.18)
4		22,848,000.00	0,8050		1,943,743.26
5		25,140,000.00	0,7488		1,455,475.98
6		25,140,000.00	0,6965		1,013,824.36
		Total P.V. of Investment		37,668,177.00	
		Total P.V. of Revenue			4,413,043.60
		Net Present Value (NPV)			<b>4,036,361.83</b>

The results of the feasibility evaluation using the net present value method at the 7.50% interest rate of the two levels of employees are related to employees who invest in normal conditions showing a positive value from the bachelor degree level to the mater degree level of IDR 4,436,361.83.

The way the net present value in estimating the results of higher education is a way of estimating the results of education in monetary terms with regard to cost factors and changes in the value of money. As stated by [72], "a dollar spent to purchase higher education is worth more, considering forgone interest, this one shows that the interest factor/interest lost if the money is saved must be deducted from the benefits (income) received after graduating from education.

Pang [73] stated that in analyzing external efficiency, education certainly can be divided into two types, namely: (a) private rate of return, comparison of educational benefits to individuals with the educational costs of the individual concerned; and (b) community benefits (social rate of return), comparison of the benefits of education to the community with the cost of education from the community.

From the results of the calculation, it can be concluded that investment can be accounted for economical values (feasibility), by looking at the criteria that NPV>1 indicates investment in education can be well received. This net present value implies that investment in education generates more cash than is needed to cover the initial capital or even debt and provides the necessary returns to the employees themselves.

**4.5 IRR Level (Internal Rate of Return)**

The IRR analysis used the interpolation formula, and the calculation result was 12.50%. Because

IRR is above the cost of capital (7.50%), investment in education is feasible. The calculation is 12.50%. The internal rate of return from continuing education at a certain time is a discount rate that equates the results of continuing education with total costs. The total cost of continuing school is the amount of indirect costs (opportunity costs) and direct costs. Direct costs include: tuition fees, fees for purchasing books and other costs (including living costs if continuing education is done outside the city).

The advantage to be obtained for employees is that continuing education means high income in the future in accordance with the level of education obtained. There is a gap in income from employees between high school graduates and college graduates. Internal rate of return (IRR) from postgraduate masters can be formulated where V (t) is the level of income of a master graduate at time t, C (t) the cost of continuing school in year t, and W (t) is the income level of a master at year t. The internal rate of return (IRR) in the context of the human capital investment can be used in several ways:

- a. Information about the IRR can be used by employees as a basis for making decisions about whether to continue school or not;
- b. Calculation of IRR can be used to explain the situation of employees such as increasing unemployment among educated employees;
- c. The calculation of IRR can be used to estimate the additional supply of employees from each type and level of education in the next few years;
- d. The calculation of IRR can be used in the preparation of educational policies and employees' planning;
- e. Calculation of social IRR is used to determine whether a particular education

program is good enough to be held or not, used in the selection of priorities and various alternative educational programs that exist in institutions, especially the university.

The development of human resources in this case is that the employees working at the university through education directly support economic growth and therefore spending on education should be seen as a productive investment and not merely seen as something consumptive without clear feedback benefits (internal rate of return). The conclusion from the discussion above is that the IRR of continuing education at a certain time is the discount rate that equates the results of continuing education with total costs. The total cost of continuing education is the amount of indirect costs (opportunity costs) and direct costs. The analysis and understanding of the calculation of IRR in the field of education can aim to formulate intuitive considerations on investment proposals that arise in an organization and can know the nature of the benefits of investment activities in education undertaken.

## 5. CONCLUSION

Based on the results of research and discussion, it can be shown as follows: (1) The payback period for education personnel has a value not more than the standard time determined based on the level of education achieved; (2) The benefits and costs of investing in education for education personnel have increased their educational qualifications and increased their name through the degrees and knowledge that have been taken during their studies. The benefits of upgrading these educational qualifications accumulate every year; (3) return on investment in education personnel get changes and benefits after investing in education, such as changes in income, productivity, and work motivation of education personnel; (4) from the results of the calculation, it can be rejected that the economic value of investment can be accounted for (its feasibility), by looking at the  $NPV > 1$  criterion which indicates that investment in education is well accepted. The net present value implies that investment in education generates more money needed to cover upfront capital or even debt and provide the necessary support to the teaching force; (5) Internal Rate of Return on education personnel is feasible.

## 6. IMPLICATION OF FINDINGS

The implications that arise from the findings of the study can be stated as follows. (1) Human capital investment in the educational perspective for the non-academic employees of Yogyakarta State University has good impacts on the employees in that they can obtain opportunities, management skills, and protection to obtain results better in a variety of economic, socio-cultural, political, legal, and security activities. (2) Human capital investment in the education perspective provides advantages related to the ability and skills of the education employees in work so that it gives positive impacts on the assessment of the institution. (3) Human capital investment makes it easier for the employees to learn the technical knowledge needed to carry out work in accordance with their functions so as to give an impact on the creation of innovations in the technical, economic, and various aspects of the people's lives and others. (4) Human capital investment in the education perspective has an impact on the changes in the quality and productivity of the education personnel working at Yogyakarta State University. (5) Human capital investment in the education has an impact on the expansion of knowledge and thinking of the employees to enable them to take rational steps in helping leaders to solve problems and make decisions.

The implication of this research can also be used for employees in companies, where companies that have global competition and need the help of superior and competent human resources.

## CONSENT

As per international standard or university standard, participant's written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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