

The Effect of Compensation Systems Design on Individuals' Investment in Learning

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ABSTRACT

This study investigates the effectiveness of four compensation schemes in promoting individuals' investment in learning. In particular we empirically examine how a compensation scheme based on Rabin's (1993) model of reciprocity compares to three traditional compensation schemes in quota, piece-rate and flat-wage. Similar in nature to the traditional flat wage scheme the flat-advance scheme does not link monetary rewards to either performance or target achievement directly. However, unlike traditional flat-wage schemes, the flat-advance scheme establishes a bond between performance and the target in its framing of the reward as a non returnable payment for target achievement.

We utilized a laboratory experiment to test our hypotheses. Consistent with our theory we find that the flat-advance scheme resulted in significantly higher investment in learning than both the traditional flat wage and quota schemes. While the flat-advance scheme also resulted in higher investment compared to the piece-rate scheme we did not find a significance difference between the two schemes.

With increased interest in individual learning and the facilitators of such learning, our study provides guidance to designers of compensation systems with regard to promoting investment in learning. Our study provides a caution not to promote investment in learning via a performance-based compensation driven increased target pressure, particularly where targets set are difficult, learning investment is costly and learning outcomes are uncertain.

Keywords: Investment in learning, Compensation Systems, Reciprocity

JEL Classification: M40

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Introduction

The importance of learning in organizations has long been recognized (refer Argyris 1992). The accounting literature has focused predominantly at either the organizational level (e.g. Chenhall 2005) or the individual level (Sprinkle 2000). Both are important as individuals acting as agents for organizations produce the actions of learning; while organizations through control system elements, such as the compensation system, create conditions that may significantly influence the individuals' motivation to engage in learning. The need for learning is reflected in practice in the magnitude of investment dollars spent by organizations on training. For example, US spending on training has averaged 2.34 percent of payroll while Canada spending has averaged 1.55 percent in 2003. On average close to 10 percent of training investment relates to procedural training (Vu 2005). Yet not all learning in the organization has to occur through formal training, as individuals explore novel ways to improve performance in their tasks.

Regardless of whether learning is formally provided by the organization or informally undertaken by individuals in the organization its effectiveness depends on the individual's motivation to engage in learning¹. Providing such motivating for individuals is one of the fundamental objectives of managerial accounting systems (Sprinkle 2000). Prior research into the role of compensation systems, an important part of the managerial

¹ Even for mandatory training course, engagement in learning is not guaranteed as individuals "go through the motions" but do not take the information on board.

accounting system, in particular has found conflicting results. Focusing particularly on the role of performance-based compensation systems, some of the studies have found no improvements in learning while others found a decrease in learning, as individuals became preoccupied with how best to do the task instead of focusing on how to do the task well (Ashton 1990, Wood et al. 1990, Hogarth et al. 1991) . More recently Sprinkle (2000) attributed the confusion in part to earlier studies not providing salient enough performance-based compensation and in part for not providing information relevant to learning. In contrast Sprinkle (2000) posited and found a positive relationship between performance-based compensation and learning, where learning was necessary for performance.

Our study builds on Sprinkle (2000) in that learning is consistent with performance increases. However, unlike Sprinkle (2000) the net performance increase in the short-term from undertaking learning in our study is close to neutral (as costs² and uncertainty surrounding the choice of engaging in learning weigh equally to the benefits from learning in the short-term) while expected net performance change in the long-term from learning is positive (as the costs of learning have a permanent positive effect without additional future costs). Our study also differs to prior studies in the context that we are interested in. Our context pertains to the situation where the individual already has a task strategy and faced with the introduction of difficult targets may find that working harder rather than smarter is sufficient for successful task performance. And we expand the

² Costs in our study relate to the opportunity forgone on working on the task as a result of undertaking the learning activity (in our case a tutorial).

focus on compensations systems by including the traditional quota scheme as well as a novel scheme which we term flat-advance compensation based on prior work on gift exchange (Akerlof 1982) and reciprocity (Rabin 1993). We limit our focus to investigating the effect these compensation schemes have on the individual's motivation to undertake learning – investment in learning.

Using an experiment, we explore the effects of these four compensation schemes (flat-wage, piece-rate, quota and flat-advance) on individuals' willingness to invest in learning. Our results lend support to the gift exchange model with flat-advance systems resulting in significantly more investment in learning than both traditional flat-wage and quota schemes. We did not find a significant difference between the flat-advance system and the traditional piece-rate systems. Our results are consistent with Sprinkle (2000) in as much as our piece-rate system resulted in significantly more investment in learning than the traditional flat-wage system.

Our study makes two significant contributions to the existing literature. First, we extend the debate over compensation system design and investment in learning to tasks where individuals already have a working strategy for task performance; face a difficult performance target as well as the prospect of a neutral short-term and positive long-term performance gain from their investment. Second we examine a new compensation system design in the form of flat-advance based on gift exchange theory, which has not previously been looked at in the context of investment in learning.

The remainder of this paper is structured as follows. The next section contains the reviews of relevant literature which provides the basis for our hypotheses. Section 3

details the experimental method and section 4 reports the results. This will be followed by a discussion of the results and conclusions and limitations in section 5.

Literature Review and Hypothesis Development

Investment in Learning

Investment in learning has two main dimensions. The need to provide an opportunity for learning (first dimension) has been recognized by firms both in terms of the current magnitude of formal investment dollars and the concern expressed that average spending levels by organizations in countries such as Canada may not be increasing adequately (Vu 2005). The need to provide relevant information and motivation to the individual (second dimension) and thus facilitate effective learning engagement by the individual has been investigated by only a relative few studies (Sprinkle 2000). Our study continues the line of research investigating the second dimension of investment in learning.

An individual's engagement in learning is a voluntary choice (Miyamoto 2003, Kolb 1984). Prior research has predominantly investigated this choice in terms of the performance difference resulting from learning (e.g. Sprinkle 2000, Ashton 1990, Wood et al. 1990, Hogarth et al. 1991) as well as effort exerted in learning as proxied by time taken on the task (where more time represented reviewing more information and thus learning). Yet in the process these studies have presented individuals with a choice to engage in learning where the task is novel to them and the benefits of learning are salient to the individual. And thus particularly the finding by Sprinkle (2000) has shown that individuals will invest in learning where benefits outweigh the costs of doing so.

What is less clear is whether this choice will persist when the task is already familiar to the individual (e.g. it's a repetitive task) and the individual already has already developed a task strategy while the organization introduces difficult performance targets to maximize performance. Particularly where expected performance increases from learning are not immediate, the individual may choose to work harder rather than smarter and thus diverge from the interest of the company concerned with motivating the latter. In this context the "opportunity cost" of investing in learning loom larger as future benefits from learning, the extent of which are going to be uncertain, have to be traded-off against immediate task performance and meeting organizational performance targets. We are particularly interested in the context where the investment in learning presents the individual with the opportunity for building a better long-term task strategy and thus potential greater performance outweighing the opportunity cost forgone in terms of short-term task performance. Yet difficult performance targets are placing pressure on meeting performance targets now confronting the individual with an investment choice that trades off certain performance now for an uncertain increase in future performance.

Compensation Systems

Interest in the design of compensation systems has a long history in management accounting. Bonner et al. (1999) provides a review of the effects of financial incentives on task performance. Providing financial incentives, which by design link monetary rewards to performance outcomes (i.e. performance-based compensation), has been shown to increase effort which translates into performance particularly for less complex tasks. Bonner et al. (1999) also identified a number of moderating factors to the financial

incentive to performance link apart from task complexity.

Studies looking into the link to investment in learning have been far fewer (Arkes et al. 1986, Ashton 1990). A number of these studies fail to find a link between monetary incentives and increased learning with some finding learning impaired by the performance-based compensation. Sprinkle (2000) identified a number of potential limitations in terms of salience and information content of the information provided. His study (Sprinkle 2000) subsequently postulated and found a positive relationship between investment in learning and performance-based compensation in the form of a piece-rate system where learning translates into performance such that gains in performance-based compensation outweigh the costs of investing in the learning.

A potential difficulty with relying on the performance-based compensation system to facilitate learning arises where the link between the choice of investment in learning and potential future outcome from learning is uncertain. The flat-advance compensation method proposed in our paper draws on recent experimental work that has shown individuals to increase their effort as a result of wage increases without a performance-contingent contract (e.g. Hannan 2005), and as such may provide a viable alternative to the traditional flat-wage, piece-rate and quota schemes.

Flat-advance vs. Flat Wage

The flat-advance compensation developed in this paper is based on Akerlof's (1982) gift exchange model. Like conventional agency models, Akerlof's gift exchange model assumes that workers have utility for wealth and disutility for effort. However, in

contrast to conventional agency models, the gift exchange model assumes that workers also have utility for reciprocity. Prior empirical studies have found results that are consistent with gift exchange. Experimental (Hannan 2005), Archival (Huang et al., 1998, Levine, 1992, Wadhvani & Wall, 1991) and field (Raff & Summers, 1987) studies have found support for an association between increased wages and productivity. Unfortunately, prescribing that employers ‘overpay’ employees in order for them to reciprocate with higher effort may not be attractive.

The flat-advance scheme put forward in this study is based on the framing of the reward and not an increase in the absolute magnitude of the financial reward. The framing is achieved by associating a portion of the financial reward with the organization’s expectation of target achievement. It is not performance contingent in the traditional sense as non-achievement of the target does not result in a cancellation of the bonus component. For example if the traditional flat wage is set up to pay the individual \$10,000 for task accomplishment in general, the flat-advance scheme could be structured to pay \$2,000 for general task accomplishment and \$8,000 for the expectation of meeting the target with the understanding that the \$8,000 will still be paid if the individual misses the target.

The motivational force behind the flat-advance scheme is based on the general model of reciprocity (Rabin 1993) where individuals are argued to reciprocate both kind and unkind intentions. Consistent with prior work into reciprocity we postulate that individuals will reciprocate the bonus paid by the organization by exerting increased effort towards the target set by the organization. As such the target set under the flat-

advance scheme is expected to be more salient for the flat-advance scheme than a traditional flat wage scheme where the link to the target is not explicitly made via the compensation scheme. The higher level of effort is expected to include seeking strategies for improving performance and thus an increased willingness to invest in learning where the opportunity for such investment is made available to the individual. Stated more formally:

H1:- Individuals on the flat-advance compensation method would be more willing to invest in learning relative to those who are paid a flat-wage

Flat-advance vs. Quota

Another more established way to induce increased effort towards a performance target is to make all or some of the monetary rewards contingent on achievement of the target. Traditional quota incentive schemes represent this type of compensation system (e.g. Demski and Feltham's 1978 "bang-bang" contract).

The motivational effects of quota schemes were discussed in Bonner and Sprinkle (2002) as well as Bonner et al. (2000). Prior literature has shown potential pit falls with using quota schemes when targets set are difficult. Both Fatseas and Hirst (1992) and Lee et al. (1997) found performance under quota schemes was less than under flat wage compensation schemes when performance targets were difficult. This was attributed to lower personal goals and self-efficacy stemming from the additional frustration experienced by individual with a higher probability of not receiving a monetary reward. What has not been examined in these studies is whether this lack of effort would extend

to these individuals rejecting the opportunity to invest in learning which is neutral in the short-term and positively related to performance in the longer term.

We postulate that unlike the flat-advance scheme, individuals in the quota scheme are subject to two opposing forces. By making monetary rewards contingent on target achievement, we postulate that quota schemes will increase the salience of the target (including investment in learning) similar to the flat-advance compensation scheme. However, the increase in target salience for the quota scheme results in a potentially large opportunity cost for the individual to engage in learning as investment in learning by definition takes away resources from performing the task and thus poses a greater risk for the individual for missing the target. When targets set are difficult and learning outcomes are uncertain, we posit that the opportunity cost imposed by the quota scheme reduces the willingness to invest in learning compared to the flat-advance scheme as individuals either exert greater effort on the task or give up on the task altogether where targets are perceived to be too difficult. We thus expect that the net effect will see individuals under a quota scheme exhibiting less willingness to invest in learning than individuals under a flat-advance scheme. Stated more formally:

H2:- Individuals under a flat-advance compensation method would be more willing to invest in learning than individuals under a quota scheme

Flat-advance vs. Piece-Rate vs. Quota

Piece-rates provide another performance contingent alternative which has been extensively studied in prior research (refer Bonner et al. 2000 for review). Unlike the

quota scheme, piece-rate systems do not incorporate a target directly as they reward performance rather than target achievement. Typically piece-rate systems pays individuals a rate for each unit of output successfully completed (Fisher et al. 2003).

Piece-rate systems on their own do not incorporate a target as increases in performance are incrementally accompanied by payment of monetary rewards. However, organizations can set targets independently. Much of the past research into the effectiveness of piece-rate systems has been in the absence of explicit targets, although some empirical studies (e.g. Fatseas and Hirst 1992 and Wright 1992) have shown piece-rates to perform at least as well as quota and flat wage compensation systems when the assigned goal was difficult.

More recently examining the role of piece-rate schemes in learning behavior directly, Sprinkle (2000) found a positive effect as individuals under the quota scheme were more likely to engage in learning directed behavior and thus performed better as a consequence of learning across a number of time periods. However, unlike earlier studies, individuals in the Sprinkle (2000) study were not under pressure to meet difficult goals using an existing strategy.

While we are interested in learning from an investment of learning perspective, our context is different to Sprinkle (2000). We are particularly interested in whether the individual is willing to invest in learning where the individual has an existing strategy in place with a difficult target to meet. While, similar to Sprinkle (2000) our investment in learning scenario is consistent with increased future performance, it is not certain that

investment in learning is necessarily going to translate into future increase in performance.

Similar to the quota scheme, individuals under the piece-rate scheme are going to be subject to two opposing forces. The contingent nature of the monetary payoff is expected to heighten the individual's engagement in task strategies that improve performance. However, unlike the quota scheme the individual has a lower opportunity cost for investing in learning as partial achievement of the target still results in receipt of monetary rewards. Yet the opportunity cost is still higher than for the flat-advance scheme, where individuals receive the entire bonus regardless of target achievement. As such, we postulate that the individual is less likely to invest in learning under the piece-rate than under the flat-advance scheme, but more likely than under a quota scheme. Stated more formally:

H3a:- Individuals under a flat-advance compensation method would be more willing to invest in learning than individuals under a piece-rate scheme

H3b:- Individuals under a piece-rate compensation method would be more willing to invest in learning than individuals under a quota scheme.

Research Method

Research Design and Subjects

To test the hypotheses, a 1 x 4 between subject design was employed. Each group was given a different compensation method design and all four groups completed a decoding

task with the opportunity to access an optional tutorial

Experimental subjects were 198 undergraduate students. Subjects were recruited from a range of courses from two major universities. In total our study contained 120 female and 78 male students. The age of subjects ranged from 17 to 30 years. Subjects were allocated to the treatment groups randomly.

The use of undergraduate students as subjects is appropriate as the experimental task is relatively simple, hence, the subjects were not required to possess any experience comparable to the population which this study seeks to generalize to (Schulz 1999, Brownell, 1995).

Experimental Task

A decoding task was employed in the experiment which was based on the task used by Chow et al. (1991). Subjects were required to convert (decode) numerical combinations of three digits into alphabets with reference to a decoding key.

Before the commencement of the experimental decoding task, subjects had to undergo a five minute training session to allow them to acquaint themselves with the task and ensured that any trends in the subjects' performance during the actual experiment was not due to initial learning. After the subjects completed the decoding task during the training session, they were given feedback regarding their performance.

After the training and feedback, all subjects were provided with specific information related to their compensation method. Subjects also received a performance target that

was ‘tight but achievable’³ and were told that they would be employed by the company for *several* periods⁴. In addition subjects were told that they could access an optional tutorial at any time during the main task.

The benefits of the tutorial were presented such that the expected utility increase from undertaking the tutorial was positive for the current period. Specifically, individuals were informed that the tutorial could potentially triple their current productivity at a cost of roughly one third of their time available to do the task (the time taken to complete the tutorial was estimated between 3 to 5 minutes with the total time available to complete the task being 15 minutes). However, they were also informed of a risk that they would not be able to get the productivity benefits from the tutorial. This risk was presented as a 50% chance of not understanding the tutorial in which case the individual faced the same reduced time to complete the task at the current productivity level. This design was adopted to enhance the realism of the experiment as in reality; a willingness to invest in learning does not guarantee that the individual will successfully learn. The expected utility from undertaking the tutorial for the current period was zero (slightly positive based on an average expectation of 4 minutes). For future periods the expected utility of the tutorial was positive with the productivity increases extending into future periods without further cost of training. As such, it was in the interest of the individual and the

³ The performance target required subjects to decode 280 codes in 15 minutes i.e. 18.7 codes per minute. This was based on the performance of the top 75th percentile during the pilot test.

⁴ This statement was included to avoid end game strategies by participants.

organization to utilize the tutorial although the benefits were not very strong in the short-term.

Due to the time constraints of the experiment, subjects who accessed the tutorial were informed that, by virtue of them choosing to access the tutorial, they were assumed to have successfully acquired additional knowledge and skill which would enable them to increase their productivity. To reduce the cognitive burden of the task, which ostensibly should increase the speed at which the subjects would be able to perform the decoding task, a new decoding table was provided to the subjects. The range of codes the subjects had to decode was halved. This particular tactic is not expected to affect the results of the study as the variable of interest is ‘if’ the subjects accessed the tutorial (i.e. their willingness to invest in learning) and not if they actually learned

Dependent Variables

The dependent variable was the overall investment in learning. We measured the investment by the number of subjects who elected to undertake the voluntary tutorial.

Independent Variables

The overall independent variable was the type of compensations scheme. All subjects were paid a flat wage of \$2 to undergo the training period before the main task started. Subsequently, subjects in the flat-wage treatment were paid a fixed \$8 regardless of their performance in the main experiment. Subjects in the flat-advance treatment were paid a fixed \$4 and an upfront bonus of \$4 for reaching the performance target. Subjects were told that they did not have to repay the \$4 if they subsequently missed the target. In the

quota treatment, subjects were paid a flat wage of \$4 and a bonus of \$4 only if they achieved the performance target. And in the piece-rate treatment, subjects were paid 0.0286 cents for every code decoded.

Other Variables

All subjects were given the same performance goal which required them to decode 280 codes in 15 minutes. This represented a “tight but achievable” target based on performance of the top 75th percentile collected from a pilot test (the pilot test is discussed further below).

Manipulation Check

We included a post-test manipulation check question in regard to their compensation method. Subjects were asked to indicate which of four compensation methods describes their compensation system. Seven percent of subjects responded incorrectly to this question. The incorrect responses were not systematically different across treatment groups (Chi-Square $p=0.313$) and hence the complete sample was used for the main analysis undertaken in our study.

As this task involved decision making under uncertainty, we measured risk preference by requiring subjects to state the price they would be willing to pay for a bet in which a coin would be flipped and if it landed heads, they would win \$100 but if it landed tails, they would win \$0. Subjects who answered \$50 were considered risk neutral, above \$50 were considered risk-seeking and below \$50 were considered risk-adverse. Our analysis found no significant difference in risk preference across treatment groups ($p = 0.211$). We also

found no significant association between risk preference and our dependent variable of tutorial selection ($p = 0.838$). We therefore excluded risk preference from the remainder of our analysis.

We also conducted an ANOVA to assess whether there were any differences in performance in the training period across treatment groups. Result showed no significant difference in performance ($p=0.431$). Our demographic checks also showed no significant differences across the treatment groups.

Pilot Test

We conducted a pilot test. Subjects in this pilot comprised of 4 students undertaking the ‘Honors in Accounting’ program and 6 PhD students. As the decoding task is fairly straightforward and requires generic skills, they were not expected to differ significantly from the undergraduate subjects used for the final experiment.

Results

Descriptive Statistics

A total of 86 subjects chose to access the optional tutorial (43%). The largest proportion of individuals accessing the optional tutorial occurred in the flat-advance treatment group (59%) followed by the piece-rate treatment (48%) then the flat-wage treatment (35%). The proportion of subjects in the quota scheme treatment accessed the tutorial the least (31% - Refer Table 1).

[Insert Table 1 about here]

As an overall test for differences across our treatment groups we conducted two tests. First, we conducted a cross-tab Pearson Chi-Square test (refer Table 2 for detail). Second we conducted a logit regression using training performance as a covariate (refer Table 3 for detail). Both tests showed significant differences between treatment groups (Pearson Chi-Square = 9.762, $p = 0.021$ and Wald Chi-Square = 7.480, $p = 0.006$). We thus explored the specific comparisons stipulated in our hypotheses further.

[Insert Table 2 & 3 about here]

Hypothesis Testing

Hypothesis 1 predicted that individuals under the flat-advance scheme would be more willing to invest in learning relative to those who are paid a flat-wage. A contrast test was used to identify if there was a significant difference in the tutorial access patterns of the subjects. Table 4 lists the results of the contrast test. The results confirm that the difference in tutorial access between flat-advance and flat-wage subjects is significant (Wald Chi-square=5.491, $p=0.036$) with subjects under the flat-advance being more willing to invest in learning than subjects under the flat-wage. Hypothesis 1 was supported.

[Insert Table 4 about here]

Hypothesis 2 postulated that individuals under a flat-advance compensation scheme would be more willing to invest in learning than individuals under a quota scheme. We find a significant difference between these two schemes with individuals under a flat-advance scheme showing a significantly greater tendency to invest in learning (Wald Chi-

square = 7.547, $p=0.012$, refer Table 4). We thus find support for hypothesis 2.

In hypothesis 3a we predicted that individuals under a flat-advance compensation scheme would be more willing to invest in learning than individuals under a piece-rate scheme. The contrast test reported in Table 4 was not significant (Wald Chi-square=1.184, $p=0.552$). We therefore did not find support for hypothesis 3a.

Further in hypothesis 3b we predicted that individuals under a piece-rate scheme would be more willing to invest in learning than individuals under a quota scheme. A contrast test reported in Table 4 shows no significant difference between the two schemes (Wald Chi-square = 2.884, $p = 0.170$). Hence we find no support for hypothesis 3b.

Discussion and Conclusion

Discussion of Results

Our study investigated the individual's willingness to invest in learning in a context where an existing task strategy already exists, targets are difficult and the payoff from investing in learning is uncertain and longer term. In such a context, the goals of the individual and the organization are likely to diverge as the organization benefits from long-term improvement in performance while the individual bears the potential short-term cost of investing in learning. We were particularly interested in whether a new approach to compensation schemes (the *flat-advance* scheme) based on Rabin's (1993) model of reciprocity would be superior in encouraging investment in learning compared to a schemes that also do not link monetary reward to performance or target achievement (the traditional *flat wage* scheme), as well as compensation schemes that link monetary

reward to performance and target achievement (the *quota* scheme) and finally compensation schemes that link rewards to performance but not target achievement (*piece-rate* scheme).

Our results show that individuals' motivation to invest in learning can be significantly increased without making the monetary reward contingent on target achievement and without increasing the absolute payout. Subjects receiving a flat-advance compensation scheme were more willing to invest in learning relative to the flat-wage subjects lending further credence to Hannan's 2005 study, Akerlof's (1982) gift exchange model and Rabin's (1993) model of reciprocity. We also found that the flat-advance scheme resulted in significantly more investment in learning than the quota scheme. We attribute this finding to the higher opportunity cost in investment faced by individuals under the quota scheme as time taken away to take the formal learning activity increases the risk to the individual of not meeting the target and hence losing the bonus. In regard to the piece-rate we found no difference in investment compared to either flat-advance or quota schemes. We argue that this is due to the lower opportunity cost of investment faced by the individual compared to the quota scheme, as increased performance is accompanied by higher monetary payoff even when the target is missed. But at the same time a lower target salience as the link to the target is not established either indirect (through the advance payment for target achievement – flat-advance) or directly (through making the monetary reward contingent on target achievement – quota). This left the piece-rate group half way between the flat-advance and quota scheme groups in terms of their investment in learning.

Research Contributions

This study makes a number of fundamental contributions to our understanding of the role of compensation schemes and investment in learning. In particular, we extend the literature on compensation systems in accounting by examining a new type of compensation scheme based reciprocity and the psychological bond formed between organizational targets and performance. We also extend the literature on learning by focusing on investment in learning a necessary precursor to subsequent learning. The voluntary decision point has not received much attention in prior literature. And finally we contribute to the current debate surrounding the measurement and incentivizing of multiple performance criteria. Investment in learning can be seen as another dimension that may have to be directly measured and rewarded. Our study shows that where the investment in learning is neutral in terms of the interest of the individual but desirable from the organization's objective, the flat-advance scheme provides a potentially desirable form of compensation without directly linking it to the investment in learning.

Limitations and Future Research Directions

Several limitations to this study should be noted. The study uses an abstracted decoding task as well as a stylized learning opportunity. The learning opportunity was presented as relatively neutral with regard to performance improvement in the short-term. Future research could extend this research by examining learning investment opportunities that represent significant performance improvement in both the short and long-term. Further the investment in learning measure is one dimensional. Extension could examine situations where the individual has the opportunity to "partially" invest by engaging in a

number of learning activities. And finally the investment in learning opportunity was limited to a one shot context. It would be interesting to see whether the motivation to invest in learning persists over a number of reinvestment points.

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Table 1: Tutorial Access (%age)

	Flat-advance group	Piece-rate scheme	Quota scheme	Flat-wage group
Accessed tutorial	30 <i>(59%)</i>	24 <i>(48%)</i>	16 <i>(31%)</i>	16 <i>(35%)</i>
Did not access	21 <i>(41%)</i>	26 <i>(52%)</i>	35 <i>(69%)</i>	30 <i>(65%)</i>
No. of subjects	51	50	51	46

Table 2 – Cross-tabulation and Chi-Square Tests

Treatment	Investment in Learning		Total
	Yes	No	
Flat-wage	16	30	46
Flat-advance	30	21	51
Piece-rate	24	26	50
Quota	16	35	51

Pearson Chi-Square 9.762, p(2-tailed) 0.021

Table 3 – Logistic Regression

Description	B	S.E.	Wald	df	Sig.
Constant	-0.328	0.718	0.208	1	0.648
Treatment	0.370	0.135	7.480	1	0.006
Training	-0.065	0.045	2.124	1	0.145

Table 4 – Tutorial Access Contrast Testing

	Wald Chi-square	p
H1: Flat-advance vs. Flat-wage	5.491	0.036
H2: Flat-advance vs. Quota	7.547	0.012
H3a: Flat-advance vs. Piece-rate	1.184	0.552
H3b: Piece-rate vs. Quota	2.884	0.170