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Abstract

The current research explored the utility maximization concept of teaching effectiveness of economics with the application of the student ratings of instruction (SRI) measuring device at a university in the southeastern US. The research methodology was quantitative, and the data were the 175 students' responses on definite items of teaching efficiency for the spring 2017 semester SRI survey at the university. Using the Cronbach's alpha statistic, the results disclosed the alpha for the 15 items on the measuring scale, which in all evaluated teaching efficiency and student motivation at the university was about .95, suggesting the items established a measuring scale that had applied internal stability dependability for the SRI design. Additionally, applying the principal axis factoring with varimax rotation, suggested the two indexes of teaching effectiveness and student self-motivation had robust positive loadings of > .40, and significantly interlinked with teaching effectiveness and student learning success. Consequently, this sanctioned the construct validity of the SRI measuring design in evaluating teaching quality. However, the research was restricted to one semester analysis of the SRI design, which may be insufficient to confirm the generalizability of the design as a measurement of teaching effectiveness. Subsequent scholarships must embrace additional semesters for a comprehensive generalizability.

Keywords: Utility Maximization, Economics, Principal Axis Factoring, Cronbach's Alpha, and Student Ratings of Instructor

Introduction

Effective teaching of economics at the university level in the US appears onerous because economics is divisible into distinct disciplines of contenders, several of which match superbly with the political philosophies in the US. Economics as a discipline has ominously weakened in status (Becker, 2004; Maxwell, 2003; Millmow, 2002, 2009, 2010; Round & Shanahan, 2010; Siegfried & Round, 2001), in recent years. These relative variations caused by endogenous and exogenous features to the economics discipline have significantly confronted economists in the academic

world (Alauddin & Butler, 2004), particularly in the teaching extent. The task of articulating the subject in the classroom becomes even more arduous partly because of the often-damaging student perception of economics as dry, hard, and uninteresting subject (Colander, 2004; Deiter, 2000; Ray, 1991). The notion that economics is controversial and hard is not recent. Solow (1983) had previously noted the huge responsibility behind the teaching of economics in the classroom was because the subject was in a disconcerted state, in addition that there was constantly the burden to adapt to existing philosophies whether from the left or right, among others.

Regrettably, these opinions of economics can poorly demoralize student knowledge and alienate possible scholar from making an allowance for economics (Colander, 2000; Deiter, 2000; Ruder, 2010) as a major. One reason for the evidently negative opinion of economics appears to be a message dilemma. Deiter (2000) noted the existing method of approach of communicating the subject material of economics lacked insight and originality to captivate students by nudging away adverse view. Some academics emphasized in commit to memory concrete expressions and concepts in instructing economics. However, Courtner, Lee, and Boatman (2013) encouraged that economics teachers must advocate for fewer prominences to remembering of expressions and concepts, and accorded additional prominences to the use of expressions and conceptions in problem solving. Gullason (2009) similarly said the negative opinion of economics came from the conception that, economics teachers were ill equipped for their teaching parts, and may be ill informed regarding the content in the framework of the
pertinent literature and related economic dealings. It seems perceptibly recognizable
teaching an economics course is a significant instructional responsibility, if mishandled, can miffed a department through the upsurge of student grievances, and a decline in its major.

In the interim, Jones (2014) noted the enduring discernment of economics as dry and unexciting subject was the recognition that, unlike their colleagues in the supplementary social sciences, economics instructors had regularly discounted the application of learning theory and research, even when the two could demonstrate constructive to their instruction. As if this is inadequate, there appears to be a disagreement on the nature of instruction between teachers of undergraduate and graduate economics in the ongoing effective teaching deliberation. Gullason (2009), for example, had previously noted there was supplementary motive to feel uneasy regarding the nature of economics teaching at the undergraduate level because the majority of the materials teachers studied in their graduate curricula were unavailable to normal undergraduate economics learners. This makes it even problematic to assess teaching effectiveness among teachers of graduate and undergraduate economics disciplines. This comes alongside the realization that, economics models on effective teaching in economics at the university level are lacking. Even the prevailing methodologies of modelling educational effectiveness appear to suggest the entire procedure hardly subsidize significantly to the enhancement of teaching proceedings (Scheerens, 2013). Consequently, models on teaching effectiveness examination should make allowance for the objectives of education, and the inferences for teaching and student learning aftermaths.

Thus, the purpose of the current research is the exploration of the concept of
teaching effectiveness in economics at the university level. The chief focus is the application of a utility maximization model, grounded on the student perception of teaching effectiveness, which embraces some components of teaching and learning, and the student self-motivation, as

a utility function. The ultimate motivation is to make allowance for the goals of education, and the construct validity, which appears to be the learning outcome of effective teaching of economics at the university level. Therefore, the current research applied a theoretical microeconomic model, to examine the concept of teaching effectiveness in economics. This is important because, notwithstanding the several existing theories on teaching effectiveness, information on applied microeconomic models on students' perceptions of teaching effectiveness in economics at the university level are lacking in the literature. This deficiency helped to reinforce the significance of an empirical and theoretical study on effective teaching of economics in higher education.

In total, it is apparent the utility maximization model is appropriate for examining teaching effectiveness in economics at the university level with the application of the student ratings of instructors (SRI) design. However, information is lacking in the current literature regarding the conjoin use of the utility maximization model and the SRI design in the examination of teaching effectiveness in economics in higher education. Consequently, the research exploration is noteworthy because of its expectation of closing the existing gaps regarding economics models on teaching effectiveness in higher education, in addition to creating the primary situation of exploring a novel design on teaching effectiveness for summative and formative purposes. The outcomes hold applied results for faculty, educational policy makers, and students, alongside the addition of a novel knowledge to the immeasurable journals on teaching effectiveness of economics at the university level.

Literature Review
Delineation and Measurements of Teaching Effectiveness

The delineation of teaching effectiveness is abstruse. There are several prevailing apt descriptions of teaching efficiency in the current literature (Barry, 2010; Feldman, 1989; Hassel, 2009; Lima, 1981; Mckeachie, 1979). Campbell, Kyriakides, Muijs, and Robinson (2005), for instance, described teaching effectiveness as the effect that the lecture hall features, such as teaching approaches, teacher prospects, classroom procedure and usage of classroom assets, have on students' learning. Cohen (1981), and Feldman (1989), for instance, recognized that, teaching efficiency was the volume of information comprehended by students in a course. In Lima's (1981) perception, teaching efficiency was the maximization of student assessment of instructors.

Mckeachie (1979) equally noted effective teaching was the proportion wherein a teacher indorsed students to enhance their academic intents. Barry (2010), in the meantime, argued teaching effectiveness encompassed a complete comprehension of theme, knowledge awareness and student deviations, organization, classroom instructional procedures, identifying seeming students, and evaluation of student comprehension and aptitude of learning results. Congruently, Hassel (2009) noted the central prerequisite of teaching efficiency must be the scholar education outcomes. This is obviously the breadth of the learner scholarship accomplishment, including complementary valued effects. There is apparently a discussion presence in the present literature on the theme of a far-reaching description of teaching efficiency in university education and its assessment procedures. It expresses the definition of teaching effectiveness diverges, including its assessment.

However, many research examinations on the assessment of university faculty on

teaching quality and students' successes utilize the student ratings of instruction (SRI) survey model (Agbetsiafa, 2010; Chen & Watkins, 2010; Donnon, Delver, & Beran, 2010; El Hassan, 2009; Hatfield & Coyle, 2013; Keeley, English, Irons, & Henslee, 2013; Osler & Mansaray, 2013, 2015). Donnon et al. (2010), for instance, noted university faculty applied SRIs to collect students' reactions concerning their courses and document progress in their instruction segments and responsibilities, which may have a noteworthy magnitude on their professions (Sprinkle, 2008). Keeley et al. (2013) had similarly contended SRIs were at large a relevant apparatus utilized by higher education institutions in assessing their professors' teaching competency. Moreover, Osler and Mansaray (2013) said the application of SRI was to impact knowledge on the scholars, together with the formation of administrative decisions, such as, the award of sustained tenure and advancement. Furthermore, SRIs were pertinent as administrative apparatuses to evaluate faculty advancement, resolutions, and tenure determination, since they assess features of professors' instruction inclination and the structures of the awarded class (Beran & Violato, 2005; Heckert, Latier, Ringwald-Burton, & Drazen, 2006). Zhao and Gallant (2012) similarly noted that many personnel operational assemblages at US universities and colleges exploited SRIs to create responses concerning tenure, advancement, merit compensation, or faculty aptitude growth. In the meantime, Liu (2012) had said that, SRI was an important module in demonstrating the trustworthiness of distance education, and was principally applicable in higher education for strategic formation, program enhancement, and faculty assessment.

Other scholars have equally said SRIs are appropriate in distributing information to the students, as well as the initiation of administrative purposes, such as, the conferment of tenure post and progression (Marsh, 2007; McKeachie, 2007). Additionally, some educators of higher education recognize that SRI is an important design, because the ratings derived from it support them in enhancing the efficiency of their teachings, since the ratings offer instructors with a comprehension of their experts and raggedness of their teaching methods, grounded on the opinion of the learner (Spooren, Brockx, & Mortelmans, 2013). In all, it appears SRI is a noteworthy device apposite for assessing faculty on teaching efficiency in higher education.

Notwithstanding the growing list of journals on the implementation of student rating devices in evaluating faculty on teaching efficiency, it rarely excludes the contradiction concerning their dependability, validity, generalizability, and their valuation aptitude of university teaching effectiveness (Agbetsiafa, 2010; Beran & Rokosh, 2009; Marsh, 2007; Osler & Mansaray, 2013, 2015). Purposely, even though some academics have argued there is hardly any signal of a relationship between student ratings and teaching competence (Madden, Dillion, & Lack, 2012; Pounder, 2007), others have contended that SRIs are important in evaluating the teaching efficacy of instructors (Agbetsiafa, 2010; Osler & Mansaray, 2013; Schrodt et al., 2008; Zhao & Gallant, 2012). Both Chen and Watkins (2010), and Zhao and Gallant (2012), for instance, had previously argued that the consistency of SRI was about the reliability, dependability, and credibility of the assessment device through the period. Explicitly, reliability concerns the inner consistency, and stability of the design utilized to assess teaching effectiveness. Despite the varied views among the academics regarding the validity and dependability of the SRI, several research explorations confirmed SRIs are trustworthy, stable across items, raters, and period, and effective (Anastasiadou, 2011; Beran & Rokosh, 2009; Kneipp, Kelly, Biscoe, & Richard, 2010; Osler & Mansaray, 2013, 2015). This appears to exemplify the import for the continuous

application of SRIs in evaluating teaching efficiency in certain colleges in the US and somewhere else.

Aside the current interlocked address on validity, there are scholars who stay intently engrossed in some detailed features of validity, primarily the construct validity of SRI as a measure of teaching competence (Agbetsiafa, 2010; Donnon et al., 2010; Osler & Mansaray, 2013; Skowronek, Friesen, & Masonjones, 2011; Sprinkle, 2008; Zhao & Gallant, 2012). Zhao and Gallant (2012), for instance, had previously referenced Cronbach and Meehl's postulation that, construct validity was the magnitude at which a confirmed valuation mirrored the leading speculative construct, which the academic had scheduled to estimate. Skowronek et al. (2011) similarly said the significance of discussing concerns on the SRI related to construct validity, as well as rejoining to whether the substance of the student rating process was comprehensible for the assessed construct.

Agbetsiafa (2010) was a principal supporter of the formation of the construct validity of the evaluation tool in the analysis of the relationship between teaching efficiency and student education results in the University of Indiana degree level course in economics. Utilizing the factor analysis on 1300 sampled scholars, Agbetsiafa found the Kaiser-Meyer-Olkin (KMO) statistical estimating on the rating scale was around .91, a signal of the suitability of the factor analysis for the data. Moreover, the Bartlett statistic for the existence of a connection among the elements was significant at $p < .0001$. In its entirety, the findings exhibited positive associations among student receptiveness of teaching competence, education provision, efficiency in communication, lucidity of the course components, and course evaluation and feedback, thus confirming the construct validity of the SRI design.

Some Selective Theories on Teaching Effectiveness

There are several postulated theories on teaching effectiveness in the literature (Apodaca & Grad, 2005; Chen & Hoshower, 2003; Mittal & Gera, 2013; Seidel & Shavelson, 2007; Shevlin, Banyard, Davies, & Griffiths, 2000). Shevlin et al. (2000), for example, hypothesized a theoretical model of teaching efficiency and charisma features, which observed the fundamental facet of the charisma of the lecturer as an esteemed component in the students' projection of teaching effectiveness ratings. Shevlin et al. noted that charisma was such a principal superiority in students' estimation of instructors that it affected the assessment of teacher competence.

Mittal and Gera (2013) applied Shevlin et al.'s (2000) concept of teaching efficiency and charisma characteristics in their student assessment research of teaching efficacy in higher education in India. Utilizing both exploratory factor and confirmatory factor analyses, Mittal and Gera (2013) recognized that scholars' judgment of the charm of their teacher defined a significant proportion of the contradiction of student evaluation of teaching as opposed to the distinct scores of measurements of "module attributes", and "lecturer ability", the two quantifiable segments in the model. The research of Mittal and Gera (2013) appears to be compatible with the research of Shevlin et al. (2000) on effective teaching.

Apodaca and Grad (2005), on the other hand, postulated a theory of teaching effectiveness from a student scholarship perspective, particularly the student-learning concept. However, Entwistle (1987) was a prior developer of the learning method model, through his supposition of the heuristic model for evaluating the teaching-learning procedure at higher education. Apodaca and Grad (2005) argued the heuristic theory centered on the characteristics

that may influence the learning methods, measures, and results of the scholar, the teaching tactic, and the institutional outline, as well as learning assets, and teaching comment, inter alia. Consequently, it appears applying the heuristic theory to assess teaching and learning results would induce a multi-layered methodology of evaluating instruction effectiveness. Apodaca and Grad (2005) moreover acknowledged the importance of the learning theory in assessing teaching competence when they said the evaluation of teaching effectiveness grounded on students' ratings must contemplate the ideas for teaching efficacy ensuing from the learning theory, among other things.

Lima (1981), on the other hand, postulated a utility maximizing model of teaching effectiveness by applying a supply theory in the following form: *Max U = U(E, y_1,..., y_m)*, where *U ≡ U* was the individual's utility function; and, E ≡ *E* was the individual's teaching effectiveness function. The foundation of the model is on the instructor's perspective of teaching efficacy, and hinges on an assortment of features, including administrative and committee labor (adverse utility), worthy instruction, consulting, and leisure. Even so, Lima (1981) cautioned that his postulated model would imply distinct similarly effective instructors would espouse dissimilar instruction styles because of disparate talent, divergent views of what constitute good teaching, and dissimilar exploration tracks to define which of the existing instruction styles appears appropriate for them. Lima's (1981) model, however, lacks any substantial empirical findings on the subject of teaching effectiveness, but the author had also advised that the exploration for empirical findings must go towards the research of new players in the teaching field often tracked and assessed for numerous years, instead of viewing at panels of instructors at a single point in time.

On the contrary, Chen and Hoshower (2003), for example, applied the expectancy theory, primarily hypothesized by Vroom (1964) in their examination of student assessment of teaching. Chen and Hoshower (2003) expressed that the expectancy theories were cognitive elucidations of human behavior that credit a person as a vibrant, considerate, prognostic creature in his or her setting. The authors advanced that the individual continuously measured the outcomes of his or her comportment and spontaneously weighed the outlook that each of his or her plausible actions headed to different inferences. Based on this methodical exploration, Chen and Hoshower (2003) deduced the scholar would adjust the extent of endeavor he or she would want to exploit in contributing to the assessment formation.

Seidal and Shavelson (2007) studied some teaching effectiveness theories, specifically, the Scheerens and Bosker (1997), and Fraser, Walberg, Welch, and Hattie (1987) process-product theories, as well as the Bolthuis (2003) cognitive theory of teaching and learning. Fraser et al. (1987), and Scheerens and Bosker's (1997) models both underscored a number of teaching effectiveness elements, as well as prompts and feedback, reinforcement, coaching, and teaching expectation, among other things, which completely impacted student knowledge outcomes. The Fraser et al's. (1987) model involved five teaching mechanisms with the supreme effect levels, as well as acceleration, reinforcement, reading and teaching, stimuluses' and feedback, and science aptitude. Congruently, Scheerens and Bosker's (1997) concept underscored teaching accountabilities, together with reinforcement, feedback, cooperative learning, differentiation/adaptive tutoring and time on task, which engendered the ultimate result degree. Concluding, in the entire specified models, teaching effectiveness and student education appears to be the essential focus and artifact, even if the applicable methodologies differed in their

scopes and extents.

The Conceptual Model: The Utility Maximization of Effective Teaching
        The conceptual model for the present research is the utility maximization model of teaching effectiveness. The model is adapted and conceptualized from Lima's (1981) economic concept of teaching effectiveness. Lima's (1981) initial utility model of maximizing teaching was a labor supply model indicated as follows: *Max U = U(E, y₁,…, yₘ)*, where $U \equiv U$ was the individual's utility function; $E \equiv E$ was the individual's teaching effectiveness function. The central focus of Lima's (1981) utility function was on a variety of factors, including research, administrative and committee work, good teaching, consulting, and leisure, (*y₁,…, yₘ*). The underpinning of his model was on the lecturer's perception of teaching efficacy.
        The novel conceptualized model applied in the present research instead focusses on the student perception of teaching effectiveness, which is:
$$Max\ U = U(E_o, S_o)$$
Where:
        $U \equiv$ is the individual student utility function of learning.
The model explains that the maximum utility of a student to master economics in an economics class is a function of the teaching effectiveness of the instructor (E_o), and the student's self-motivation (S_o) to learn.
        However, this concept is conditional on:
$$E_o = E_o(t_1,…,t_n);\ and,$$
$$S_o = S_o(m_1,…, m_k)$$
Where:
        $E_o \equiv E_o(t_1, t_2,…, t_n)$ are the components of the instructor's teaching effectiveness
                functions.
        $t_1, t_2,…, t_n \equiv$ are the individual characteristics of teaching, grouped into
                components, which together assesses teaching effectiveness.
        $S_o \equiv S_o(m_1,…, m_k) \equiv$ are the components of the student's self-motivation
                functions.
        $m_1,…, m_k \equiv$ are the individual characteristics of the student's self-motivation,
                grouped into components, which together assesses the self-motivation of
                the student to learn economics.
Therefore:
        Max U = U(E_o, S_o) ≈ learning success (**φ**)
                        And **φ** > 0
That is, the student utility maximization (*U)* of learning = $f(E_o, S_o) = \pi_1 E_o + \pi_2 S_o$, which together equals the student learning success (**φ**).
Hence:

$$\frac{\partial u}{\partial t_1} > 0, \quad \frac{\partial u}{\partial t_2} > 0, \quad \frac{\partial u}{\partial t_n} > 0, \quad \frac{\partial u}{\partial m_1} > 0, \frac{\partial u}{\partial m_k} > 0 \approx \boldsymbol{\varphi}$$

Model Assumptions

The model holds the following assumptions:

1. The economics teacher is a qualified and capable instructor, and holds the available teaching resources, to effect proficient teaching in the classroom.
2. The scholar holds the existing school resources, and is a highly motivated learner.
3. The model assumes to hold constant all other exogenous and endogenous constraints that may influence the maximization of utility at the student and faculty level. This would imply, for example, that social, physical, and financial constraints, including research, leisure, prices, incomes, and marginal utility, inter alia are all equivalent to 0.

Methodology

The methodology for the present research is the quantitative design, and the data are the students' responses from the SRI survey of economics faculty. The methodology encompasses some selected statistical concept specifications.

Statistical Concept Specifications

The principal inference in the present research is the application of the SRI survey design, to analyze the concept of utility maximization of teaching effectiveness in economics. The utility maximization conception focusses on the student perception of teaching effectiveness, and the applicability of the SRI survey becomes noteworthy in this respect. Therefore, the primary assumption of the SRI survey is that the design displays internal reliability in the assessment of teaching efficiency in higher education. The statistical concept for this postulation is the Cronbach's alpha (α), after Cronbach (1951). Therefore, referencing Field (2013), the concept specification for the Cronbach's alpha is the Equation (1), and is appropriate to determine the reliability of the SRI design:

$$\frac{A^2 Covariance}{\sum s^2_{item+} \sum Cov_{item}} \tag{1}$$

The concept in Equation (1) evidently specifies a rating scale embracing items, and it is conceivable to estimate the variance confined in a separate item, as well as the covariance between a detailed item and any accompanying item on the assessment scale. Given this display, a variance-covariance matrix calculation of the comprehensive items is a probability. Alluding to Field (2013), the oblique principles in the matrix identify the variance confined in an explicit item, and the off-oblique principles espouse covariances inside the assemblage of items. The upper share of the concept is the square of the amount of items (A) multiplied by the mean covariance amongst the items. The bottom share of the concept seems to be the comprehensive item variances and item covariances. The scale of the Cronbach's alpha statistic spreads from 0 to 1. Field (2013) even drew attention to the realization that, the greater the scale, the uniqueness the discerning items harmonized as a group in evaluating the device construct, and thus, the uniqueness of the dependability of the assessment device. Thus, a Cronbach's coefficient alpha of 1 primarily indicates a perfectly trustworthy rating instrument, and a coefficient estimation of 0 indicates an unreliable rating instrument.

The complementary inference in the present research exploration postulates the application of the SRI design in evaluating teaching effectiveness displays construct validity in the measurement of teaching efficacy in higher education. The statistical concept for this conjecture

is the factor analysis, particularly, the principal axis factoring (PAF), following analogous presentations by de Winter and Dodou (2012), and Ngure, Kihoro, and Waititu (2015). de Winter and Doduo (2012), for instance, contended the PAF was a least-squares estimation of the shared factor model. PAF engenders no hypothesis regarding the type of error and condenses the unweighted sum of squares or ordinary least squares of the residual matrix. Hence, alluding to the concept of de Winter and Doduo (2012), the PAF statistical model specification is the Equation (2), and is appropriate in determining the construct validity of the SRI design in assessing teaching effectiveness:

$$G_{\text{OLS}} = \frac{1}{2} tr[(D - \Sigma)^2] = \sum_p \sum_e (D_{pe} - \sigma_{pe})^2, \qquad (2)$$

where D_{pe} and σ_{pe} are constituents of the acknowledged sample correlation matrix, as well as the implied correlation matrix, respectively. Ngure et al. (2015) equally underlined the comprehension that, the PAF concept was a type of exploratory factor analysis, which restricted the variance that was common among items, specifically; it did not reorganize the variance that was unique to any distinct item.

Data

The relevant data for the present research exploration are students' responses from the spring 2017-semester student ratings of instructor (SRI) survey on faculty at a historically black university, situated in the southeastern section of the US. The SRI is a required online survey administered to all students, to assess their lectures on teaching effectiveness in their enrolled courses for the semester. Survey responses from students in the School of Business at the university, specifically students offering economics at various levels in the selected semester, were overtly targeted for the present research. 175 students of economics courses responded to the spring semester survey. The SRI survey evaluation instrument is a 5-point Likert scale measuring devise, and has 15 items in all.

The SRI survey devise has two subscales. The first subscale has three items, which assesses the student's self-motivation and efforts engendered in the course, with a scale of 1 through 5. A scale of 1 on each item suggests minimum effort, and a scale of 5 implies a supreme effort and self-motivation in learning the implied course materials. In addition, the succeeding subscale on the survey device has 12 items, which supposed to evaluate the teaching effectiveness of the instructor, with a measuring scale of 1 through 5. A scale of 1 on each item implies ineffective teaching, and a scale of 5 infers a supreme teaching effectiveness.

Results

The primary purpose of the present research is to substantiate the utility maximization model with the SRI survey, to evaluate faculty on teaching effectiveness. Given this, the postulation of Equation (1) on page 9 was to determine the reliability of the survey device in assessing the self-motivation of the student, and the teaching efficacy of the faculty. Therefore, the application of the SRI supposition in Equation (1) research presumed the device established reliability in its assessment of the selected constructs. The exploration encompassed and satisfied a primary analysis of the conjecture of linearity, normality, and a modest level of association among the items. In Equation (1), the applicability of the Cronbach's alpha test statistic was significant; to solve the concern of the dependability of the SRI design in measuring

the two constructs (self-motivation and teaching effectiveness) in their entirety. The results of the examination encompassed a preliminary item descriptive statistics (that is, the mean, and standard deviation), to unveil any possible variance among the 15 items on the rating scale. Table 1 is an outline of the descriptive item statistics of the applicable variables applied in the present research exploration, which appears transparent. According to Table 1, there was scarcely any difference and spread between the mean for item A2 (*I have attended class regularly*) (*M* = 4.51, *SD* = .734) and the mean for item A3 (*I have completed the required readings for the course*) (*M* = 4.53, *SD* = .677) on the rating measure, for instance.

Given the nonexistence of any endless variation among the items on the measuring scale, the appropriate unstandardized Cronbach's alpha in Table 2 was substantial in the explanation of the reliability figure of the SRI device, following a comparable postulation by Leech, Barrett, and Morgan (2014). Consequently, in Table 2, the Cronbach's alpha for the 15 items on the measuring scale, which collectively evaluated student motivation and effective teaching at the university, was .95, a suggestion the items acknowledged a scale that had applied internal constancy dependability for the SRI design. Additionally, Table 3 is a summary of the item total statistics, which remained the reliability results for the separate items on the SRI measuring scale. The two complete significant segments in Table 3 were the corrected-item-total- correlation, and the alpha-if-item-removed. The former was the association of the individual complete item with the total aggregate of the residual items on the SRI scale. Leech et al. (2014) noted if the association of this appeared to be >= .40, then the presumption was that, the defined item seemed measured to be nonetheless moderately interrelated with several of the items on the measuring scale. Therefore, in Table 3, nearly all the items on the measuring scale had significant inter-correlations with one another. The scale mean for item 5 (B2), for instance, was 59.83, and had a significant positive association (*r* = .88) with other items on the measuring scale. Furthermore, the sector in the far right of Table 3 was the alpha coefficient estimation for the distinct item on the SRI scale, and this revealed the items were

Table 1
Summary of Item Statistics

Item	Mean	SD	N
A1	4.50	.651	175
A2	4.51	.734	175
A3	4.53	.677	175
B1	4.26	.975	175
B2	4.12	1.068	175
B3	4.18	1.038	175
B4	4.14	1.076	175
B5	4.05	1.154	175
B6	4.15	1.014	175
B7	4.10	1.097	175
B8	4.31	.939	175
B9	4.34	.856	175
B10	4.34	.932	175
B11	4.26	.963	175
B12	4.17	1.085	175

Note: A1 = I have put a greater deal of effort into this course. A2 = I have attended class regularly. A3 = I have completed the required readings for the course. B1 = the stated goals and objectives for the course are consistent with what was taught. B2 = the extent to which they encourage class discussion. B3 = the instructor clearly presents his/her subject matter. B4 = the instructor is enthusiastic and arouses interest in this course. B5 = my power to think, criticize…improved as a result of this course. B6 = the texts and other readings assigned for this course have been helpful. B7 = the instructor uses instructional approaches…effectively enhance learning in this course. B8 = the examinations are consistent with the course objectives and the instruction. B9 = quizzes, examinations and/or written assignments…help me evaluate my progress. B10 = the instructor is genuinely concerned with students' progress. B11 = I am able to get help from the instructor when I need it. B12 = this instructor is effective in promoting learning.

reliable and exceptionally inter-connected and, jointly, they engendered exceptional internal dependability consistency. Therefore, the findings in Tables 2 and 3 for all 15 items on the SRI measuring scale mutually showed the learners offered broadminded assessments of the

Table 2
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	*N* of Items
.953	.949	15

effectiveness of teaching they received at the university, and the items formed a measuring scale that held substantial inner consistency dependability. Given this realization, the SRI device revealed robust internal reliability in evaluating the constructs on student self-

Table 3
Summary Element-Total Statistics

	Scale Mean if Item Removed	Scale Variance if Item Removed	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Removed
A1	59.45	118.939	.448	.436	.955
A2	59.44	119.765	.337	.612	.957
A3	59.43	120.074	.350	.604	.956
B1	59.70	107.868	.835	.767	.948
B2	59.83	105.277	.881	.862	.946
B3	59.78	106.519	.846	.812	.947
B4	59.81	106.729	.802	.730	.948
B5	59.91	104.038	.865	.823	.947
B6	59.80	108.977	.743	.697	.950
B7	59.86	106.778	.783	.685	.949
B8	59.65	109.517	.780	.727	.949
B9	59.61	110.906	.781	.676	.949
B10	59.62	109.123	.808	.793	.948
B11	59.70	108.281	.824	.835	.948
B12	59.78	105.493	.855	.863	.947

motivation and teaching efficiency of economics.

Alongside the preceding findings is the associated supposition in Equation (2) that, the applicable SRI design established a construct validity in the measurement of student self-motivation and teaching effectiveness of economics at the university. The application of the principal axis factoring (PAF) with varimax rotation was significant in Equation (2), which estimated the crucial configuration for the 15 items on the SRI rating scale on teaching effectiveness and student self-motivation. The use of two factors on the PAF exploration was noteworthy because of the understanding the objective of the items on the SRI design was to present two constructs of student self-motivation and teaching effectiveness. Tables 4, 5, and 6 revealed the results of the PAF test statistic.

Table 4

Correlation Matrix

		A1	A2	A3	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Correlation	A1		.538	.558	.347	.359	.301	.356	.367	.335	.293	.365	.349	.335	.324	.317
	A2	.538		.737	.312	.273	.234	.212	.318	.264	.223	.219	.175	.190	.137	.213
	A3	.558	.737		.282	.262	.268	.196	.293	.258	.264	.241	.233	.200	.188	.190
	B1	.347	.312	.282		.831	.789	.715	.786	.646	.670	.685	.686	.663	.670	.697
	B2	.359	.273	.262	.831		.877	.770	.821	.614	.701	.679	.697	.744	.752	.815
	B3	.301	.234	.268	.789	.877		.734	.780	.618	.707	.693	.701	.681	.713	.748
	B4	.356	.212	.196	.715	.770	.734		.786	.549	.631	.593	.658	.714	.702	.801
	B5	.367	.318	.293	.786	.821	.780	.786		.628	.705	.666	.659	.686	.719	.848
	B6	.335	.264	.258	.646	.614	.618	.549	.628		.720	.765	.667	.596	.636	.624
	B7	.293	.223	.264	.670	.701	.707	.631	.705	.720		.624	.662	.687	.678	.691
	B8	.365	.219	.241	.685	.679	.693	.593	.666	.765	.624		.740	.642	.700	.659
	B9	.349	.175	.233	.686	.697	.701	.658	.659	.667	.662	.740		.683	.687	.654
	B10	.335	.190	.200	.663	.744	.681	.714	.686	.596	.687	.642	.683		.863	.795
	B11	.324	.137	.188	.670	.752	.713	.702	.719	.636	.678	.700	.687	.863		.843
	B12	.317	.213	.190	.697	.815	.748	.801	.848	.624	.691	.659	.654	.795	.843	

Note: Determinant = .001

Table 4 is the assessed correlation, including the level of significance for the 15 items on the SRI measuring scale on teaching effectiveness and student self-motivation. All the 15 items were significant (p = .001) and had moderate to high association with each other, implying they may create one or two factors. Table 5 is the Kaiser-Meyer-Olkin (KMO) statistic.

Table 5
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.929
Bartlett's Test of Sphericity	Approx. Chi-Square	2559.094
	df	105
	Sig.	.000

which was a valuation of the appropriateness of the sample, explicitly, whether there were enough items predicted by separate factors. The KMO statistical valuation spreads from 0 to 1, where a value in the neighborhood of 1 is an indication the configuration of relationships is condensed and, subsequently, the factor analysis be anticipated to engender a unique and dependable factor (Agbetsiafa, 2010). Leech et al. (2014) had likewise argued the KMO statistic had to be > .70 to sanction tolerable items for separate factors. In Table 5, hence, the KMO statistic for the 15 items on the SRI measuring scale was .929, thus indorsing the sampling appropriateness for the KMO exploration. Table 5 similarly exhibits the Barlett's test of sphericity, which is an evaluation of the *null hypothesis* that, the principal association matrix seems to be an identity matrix. Leech et al. (2014) had earlier said the Barlett's test of sphericity ought to be significant (p < .05) to sanction that the correlation matrix expressively varied from an identity matrix, where relations among items were completely 0. Consequently, in Table 5, the Barlett's test of sphericity, $\chi^2(105)$ = 2559.094, p < .0001 was significant, signifying the relations among the 15 items on the SRI measuring device were sufficiently powerful for PAF analysis.

Table 6 is the findings of the explanation of the complete variance of the 15 items on the measuring SRI scale. A primary application of two factors on the PAF statistical concept was substantial, founded on the realization the composition of the items on the SRI measuring device was to index the two constructs, which were the faculty teaching effectiveness and the

Table 6
Total Variance Explained

Compone nt	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% Variance	of Cumulative %	Total	% Variance	of Cumulative %
1	9.173	61.151	61.151	8.245	54.966	54.966
2	1.890	12.601	73.753	2.215	14.769	69.735
3	.717	4.782	78.535			
4	.592	3.947	82.482			
5	.4773	3.179	85.660			
6	.371	2.471	88.131			
7	.347	2.314	90.445			
8	.292	1.944	92.389			
9	.262	1.744	94.133			
10	.206	1.376	95.509			
11	.197	1.316	96.825			
12	.168	1.122	97.946			
13	.119	.791	98.738			
14	.108	.721	99.459			
15	.081	.541	100.00			

Note: Extraction Method: Principal Axis Factoring.

student self-motivation. Subsequent to the varimax rotation, the first factor accounted for approximately 54.97% of the variance, and the second factor accounted for approximately 14.77% of the variance. Table 7 exhibits the 15 items and factor loadings for the rotated factors, with loadings of < .40 excluded for lucidity. The first factor, which seemed to index faculty teaching effectiveness, had robust positive loadings on all 12 items of >= .72. The second actor, which seemed to index the student self-motivation, had robust positive loadings on all three items of >= .60. In Table 7, one of the items, '*The subject matter of this course is well organized*', for example, demonstrated a robust positive loading of >=.88 on the teaching efficacy factor. Likewise, "*The instructor is genuinely concerned with students' progress*", for example, also demonstrated a robust positive loading of >=.84 on the teaching efficiency factor. Meanwhile, '*I have completed the required readings for the course*', for instance, established a robust positive loading of >=.86 on the student self-motivation factor. Equally, '*I have attended class regularly*', for instance, correspondingly demonstrated a robust positive loading of >=.85 on the student self-motivation factor.

In all, the two factors of self-motivation and teaching together had strong loadings of >=.60, and interconnected significantly with teaching effectiveness and, in so doing, endorsed the construct validity of the SRI measuring instrument applied in assessing teaching.

Table 7

Rotated Factor Matrix

	Factor Loading	
	1	2
I have put a great deal of effort into this course		.60
I have attended class regularly		.85
I have completed the required readings for the course		.86
The stated goals and objectives for the course are consistent with what was taught	.81	
The subject matter of this course is well organized	.88	
The instructor clearly presents his/her subject matter	.85	
The instructor is enthusiastic and arouses interest in this course	.82	
My power to think, criticize…improved as a result of this course	.85	
The texts and other readings assigned for this course have been helpful	.72	
The instructor uses instructional approaches…effectively enhance learning in this course	.78	
The examinations are consistent with the course objectives and the instruction	.78	
Quizzes, examinations and/or written assignments…help me evaluate my progress	.79	
The instructor is genuinely concerned with students' progress	.84	
I am able to get help from the instructor when I need it	.87	
This instructor is effective in promoting learning	.89	

Note: Removal of Loadings <.40

efficacy and student learning success.

Analysis of Results

The focus of the current research is the exploration of a utility maximization concept, founded on the student perception of teaching effectiveness that encompasses some components of teaching and learning, and the student self-motivation, as a utility function. This utility function embodies the application of the student ratings of instructor (SRI) measuring instrument in the assessment of teaching effectiveness altogether. Developing Equation (1) was significant, to determine the reliability of the SRI measuring device applied to evaluate faculty on teaching quality and the confirmation of the utility function of effective teaching of economics in higher education. Utilizing the Cronbach's alpha test statistic to estimate Equation (1), which

explores the reliability of the SRI measuring device, the results in Table 2 reveal a Cronbach's alpha test statistic of about .95, principally illustrating a great internal homogeneity of the learners' rejoinders to the 15 items on the SRI measuring scale. Subsequently, the finding validates the reliability of the implement as a conceivable measure of teaching efficiency and student motivation at the university. The results are equivalent to a few findings on the reliability of the SRI measuring device on teaching efficacy with the application of the Cronbach's alpha test statistic (Agbetsiafa, 2010; Anastasiadou, 2011; Beran & Rokosh, 2009; Donnon et al., 2010; Kneipp et al., 2010; Osler & Mansaray, 2013, 2015; Safavi, Bakar, Tarmizi, & Alwi, 2012). The findings also validate the utility maximization model in the effective teaching of economics through the SRI internal homogeneity statistic.

Moreover, the inter-total statistics in Table 3, which appears as subdivision of the reliability test statistic, shows all 15 items on the SRI measuring scale mutually specifies that, the learners advance continuous assessments of the instructional quality they acquired at the university, and the items create a measuring scale that has substantial internal uniformity reliability. Given this, the SRI measuring device discloses robust internal reliability in assessing the constructs on student self-motivation and teaching efficiency of economics at the university. The results are correspondingly analogous to some of the reliability findings on teaching quality with the application of the SRI device (Agbetsiafa, 2010; Anastasiadou, 2011; Donnon et al., 2010; Kneipp et al., 2011; Osler & Mansaray, 2013, 2015). In sum, the SRI instrument seems to have a strong inner dependability.

The succeeding analysis is the determination of the validity of the SRI design as a measure of teaching efficiency at the selected university, which embraces Equation (2) of the contemporary research. Applying the factor analysis, predominantly the principal axis factoring (PAF) with varimax rotation, to explore construct validity, the results discloses the Kaiser-Meyer-Olkin (KMO) statistic on the SRI measuring scale in Table 5 is around .93, thoroughly outside the >.70 advocated by Leech et al. (2014) in authenticating the sampling appropriateness for the PAF exploration. Table 4 is the evaluated relationship, including the level of significance for the 15 items on the SRI measuring scale on teaching efficacy and student self-motivation. The entire 15 items are significant and have moderate to high relationship with each other, suggesting they may generate one or two factors. Table 5 also displays the Barlett's test of sphericity, which is an assessment of the *null hypothesis* that, the primary relationship matrix appears to be an identity matrix. The KMO findings together with the statistically significant Barlett's sphericity in Table 5 establish that the 15 items on the SRI measuring scale are amply strong for the PAF analysis. The results are similarly comparable to the KMO and Barlett's sphericity findings of the SRI measuring design on teaching efficiency with the use of the factor analysis in analogous research studies (Agbetsiafa, 2010; Donnon et al., 2010; Osler & Mansaray, 2013, 2015; Sprinkle, 2008). Additionally, the use of two factors on the PAF analysis seems substantial because of the realization that, the purpose of the 15 items on the SRI design is to index two constructs of teaching effectiveness and the student self-motivation. Subsequent to the varimax rotation, the results in Table 6 implies the two factors on teaching effectiveness and self-motivation together accounts for about 69.74% of the complete variance of the 15 items on the SRI measuring scale. In addition, the factor loading for the 15 items reveal in Table 7 entirely hold loadings > .40, and are significantly related to teaching efficiency, thus endorsing the construct validity of the SRI measuring instrument as an assessment design of faculty and learners on teaching excellence,

and student self-motivation at the university. The construct validity results are comparable to similar results by other academics (Agbetsiafa, 2010; Safavi et al., 2012; Osler & Mansaray, 2013, 2015), with the utilization of the factor analysis in evaluating faculty on teaching effectiveness. In conclusion, the research establishes a robust interlinking between the ratings of students on the SRI measuring scale and the two modules on teaching competence and student self-motivation, applying the utility maximization concept of effective teaching.

Model Limitations

The utility maximization model did not reflect on course structure, organization, goals, and the features, intricacy, and significance of a course, all expressed as noteworthy in teaching effectiveness (Osler & Mansaray, 2013, 2015). In addition, reflections were zilch to faculty features like research, administrative and committee work, consulting, and leisure on the model (Lima, 1981). These limitations, nevertheless, barely affect the efficacy of the utility maximization model because the concept assumes to hold constant all other exogenous and endogenous constraints that may influence utility maximization at both the student and faculty levels.

Furthermore, a crucial inadequacy of the utility maximization model is that, it is so universal that it can expound on everything (Hodgson, 2012). If this argument holds, this principally implies the explanatory supremacy of the utility maximization model in detailed occurrences histrionically lessened. An intricate scrutiny of its declared realizations discloses that, the findings continuously hinge on supplementary assumptions (Hodgson, 2012). Becker (1976, 1991, 1996), for example, had argued that regular rationality conjectures engendered several testable projections regarding human behavior. Nonetheless, Becker's entire conjectures had hinge on suppositions supplementary to his principal truisms of utility maximization.

Moreover, the utility maximization model disregards the difficulty of describing the causes of human behavior, and it manipulates the enquiry of the individual progress of aptitudes and personalities (Hodgson, 2012). A counter-intuitive argument is that, the application of the utility maximization model in the contemporary research is not envisage in describing the cause-and-effect of a behavior, but rather the perception of students on teaching effectiveness and the construct validity of the design used to assess teaching efficiency of economics in higher education. Despite these confines, utility maximization is a crucial component of several theoretical methodologies in describing behavior, including rational analysis (Anderson, 1990), and the ultimate observer theory (Geisler, 2011). Thus, the utility maximization is an ideal concept for explaining the perception of students concerning teaching effectiveness with the use of the SRI measuring device.

Conclusion

The purpose of the contemporary research was the exploration of the utility maximization concept with the use of the SRI measuring device in assessing faculty on teaching effectiveness and the student self-motivation in the overall student learning success. A primary descriptive item statistics of the elements used in the contemporary research was striking, to disclose conceivable differences and dispersals among the items of focus. Furthermore, the use of the Cronbach's alpha test statistic was also noteworthy since it facilitated the resolution of the concern of the reliability of the SRI evaluation design as detailed in Equation (1). The results on

the Cronbach's alpha reliability test statistic revealed the alpha for the 15 items on the SRI, which collectively measured teaching efficiency of economics at the university, was about .93 (superior), consequently establishing the extraordinary reliability of the SRI measuring design for effective teaching evaluation. This is additional to the realization that, the consistency results for the individual items on the SRI scale also revealed the 15 items were reliable and remarkably interrelated and, together, they produced excellent internal constancy dependability.

The supplementary assumption in the contemporary research, disclosed in Equation (2), was the determination of the construct validity of the SRI measuring design in evaluating faculty on effective teaching and the student on self-motivation at the university, using the utility maximization concept. The relevant principal axis factoring (PAF) with varimax rotation model had two factors, which were important since the purpose of the 15 items on the SRI measuring design was to index two constructs of teaching effectiveness and the student self-motivation. The PAF results specified the 15 items on the measuring scale had sampling aptness, and that the self-motivation and teaching effectiveness factors together accounted for about 69.74% of the overall variance. In addition, the PAF results also revealed the two factors of self-motivation and teaching quality in total had robust loadings of > .40, and significantly related to teaching quality and student learning success and, in this manner, endorsed the construct validity of the SRI measuring instrument as an assessment tool of teaching efficacy of
economics at the selected university.

Given this, the realization of the SRI measuring instrument is that, it is a valid and reliable design on the detailed items of teaching efficiency and self-motivation, and is applicable in establishing and authenticating the concept of utility maximization of instructional quality and student learning success in economics at the university. The results are noteworthy because of the enduring engagement among the academics to settle on the cogency and dependability of the extensive use of the SRI as a measuring design in assessing instructional quality in higher education. Consequently, educational policy planners, and the faculty at the university should encourage policies to streamline the items on the SRI instrument that directly reflects utility maximization of teaching effectiveness through students' perception regarding instructional quality.

Even with this strategy validation, the research exploration is not without its limitations. Specifically, the leading perception of rationality as utility maximization is exactingly non-falsified and hardly presents a practical causal description of human behavior. The research was also restricted to one semester analysis of the SRI tool, which may be insufficient to confirm the generalizability of the design as a measuring instrument of teaching proficiency. Moreover, the contemporary research fell undersized of its purpose because the assessment of the construct validity of the SRI device was multipurpose, and not entwined to a definite course or lecturer. Hence, the ratings on the SRI measuring scale are collective, and may alter if tabled to evaluate a course or a teacher. Nevertheless, the research study was forceful and conclusive. It expedited the cessation of the inadequate information in the present literature regarding the concept of utility maximization in the teaching field, the consistency and construct validity of the SRI survey design, and its possible application in assessing faculty on teaching efficiency and student learning success. The findings also had concrete deductions for educational policy planners, faculty, administrations, and students, including the addition of an innovative knowledge to the

seemingly ceaseless journals on the evaluation of faculty on teaching efficiency in higher education.

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