

**AN ANALYSIS OF CONTEMPORARY SECONDARY AND POST-SECONDARY EDUCATIONAL ISSUES:
COMPARING THE PERCEPTIONS OF JAPANESE AND US EDUCATORS**

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Abstract

The intent of this practitioner-based research study is to provide a comparison between Japanese and US educators' perceptions regarding contemporary secondary and post-secondary educational issues (i.e., college and career readiness, globalization, work ethic, tenure, CTE, professional development, etc.). A survey tool served as the instrument for data collection. Both descriptive and inferential statistical methods (FIG model and t-test, respectively) were utilized to analyze the data collected. In addition, the author provides US-focused commentary on the topics examined therein. (NOTE: This project was made possible as a result of a Fulbright "Specialist" Scholarship awarded to the author on December 6-21, 2010 at Senshu University in Tokyo, Japan.)

INTRODUCTION

This author was awarded a Fulbright (Specialist) Scholarship in December of 2010 for Labor and Industrial Relations. The assignment was to deliver a series of related-lectures—as a visiting scholar—at Senshu University in Tokyo, Japan. Since this author already published a number of professional journal and peer-reviewed journal articles in the areas of career and technical education, labor-management relations, and international workforce development matters, it seemed appropriate that while in Tokyo, research be performed encompassing the subject areas mentioned above. To this end, a (comparative) survey was designed to examine contemporary secondary and post-secondary educational issues. The survey instrument was distributed to students and educators in Japan and educators in the USA. The data collected were analyzed by topic using the FIG model (Refer to Appendix A for more details) and in aggregate using a t-test for independent samples (Refer to Appendix C for more details).

METHODOLOGY

While in Japan, this author enlisted the assistance of Dr. Mito Akiyoshi of Senshu University's Department of Humanities and Doctoral Student/Researcher Satomi Era of Hitotsubashi University's Graduate School of Social Science to disseminate and collect a paper and pencil version of the survey instrument. Ten contemporary education topics were selected and each question allowed for a response based on a four-point Likert scale ranging from disagree (-2) to agree (+2). NOTE: These surveys were only distributed to English-speaking Japanese students and faculty members at the two institutions mentioned above ($n_{\text{Japan}} = 12$). Upon the author's return to the USA, the survey was formatted and disseminated to secondary and post-secondary educators via the online survey tool: SurveyMonkey. Once complete, the author contacted Mr. Shane Trafton of the Special School District of St. Louis County to obtain an email list for distribution to secondary educators ($n_{\text{US}} = 23$). Concurrently, this author contacted Mr. Gil Kennon of Mineral Area College in Park Hills, MO to obtain an email list for distribution to post-secondary educators ($n_{\text{USps}} = 14$). Therefore, $n_{\text{US}} = 37$ while $N = 49$ (Refer to Appendix B for Demographics). Survey completion rates were as follows:

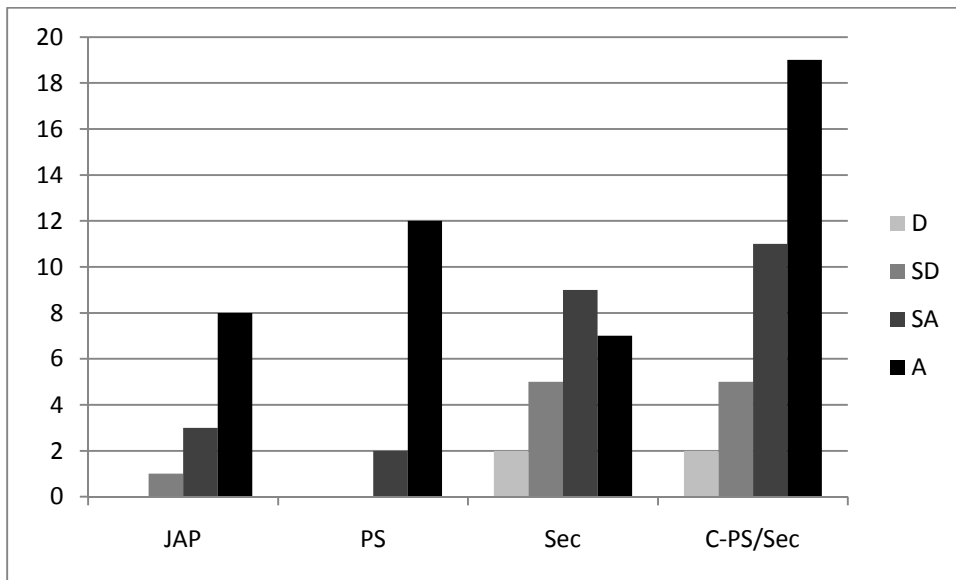
Japan = 100 percent (12 of 12);
Secondary = 100 percent (23 of 23); and
Post-Secondary = 93 percent (14 of 15)...
TOTAL = 98 percent (49 of 50).

Upon collection, the author took a two-stage approach of analyzing these data: individually and collectively. Each of the ten topics was examined individually utilizing a descriptive statistical technique known as the FIG model (Refer to Appendix A for details). Once these findings were identified, the author provided observations, via a US-focused commentary, at the conclusion of each topic. In addition, the author analyzed the data from these 10 survey topics, in a collective manner, by means of an inferential statistical technique known as the t-test for independent samples. Herein, the Japanese participants served as the experimental group while the US participants served as the control group. Regarding this portion of the study, statistical analysis was performed—on SPSS—utilizing a one-tailed t-test for independent samples (Refer to Appendix C for more details).

RESULTS: Individual Analysis

1) College & Borderless Economies:

Duncan (2010, p. 67) says, “The borderless nature of innovation, manufacturing, and research and development has made national economies far more interdependent than in the past.” Accordingly, in the new knowledge economy, the workers with the most to gain will be those who are college-educated.



Findings: The FIG model (Refer to Appendix A for calculations and further details) reveals that the Japanese participants were more inclined to agree with—the viewpoint that college-educated workers will gain the most in a knowledge-based economy than—the US participants by a margin of 1.50 to 1.0811, respectively.

Commentary: On one hand, Carnevale, Strohl, and Melton (2011, p. 7) note, “...while we found that any degree is better than no degree, we also found that there are significant differences.” On the other hand, Arum and Roska (2011, p. 127) suggest, “It is not enough for higher education institutions simply to confer educational degrees...if the credentials do not reflect substantive academic accomplishments and if the students have not developed an appreciation of the meaning and responsibilities associated with their acquisition.” In this author’s opinion, gains from students who have earned college degrees may not be evident early-on. Therefore, for nations to garner greater returns on their investments, in human capital, at all stages (from short to medium to long term) of employees’ life cycles, it is incumbent upon these systems to better prepare K-12 school students for their upcoming college experiences through meaningful and on-going career and college guidance/preparation exercises (i.e., Kuder, WorkKeys, etc.) beginning in middle school.

LEGEND:

JAP = Japan

PS = Post-Secondary (USA)

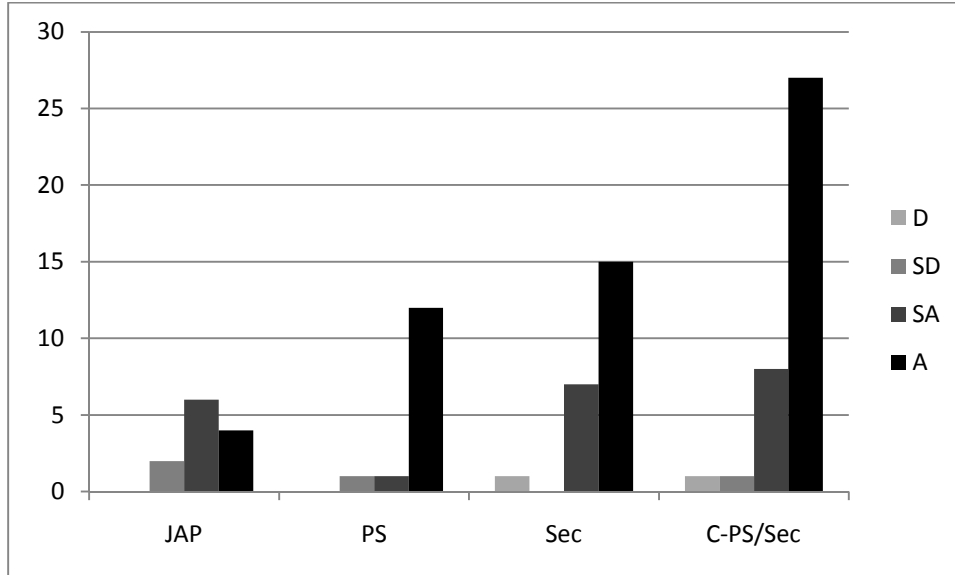
Sec = Secondary (USA)

C-PS/Sec = Combined Post-Secondary & Secondary (USA)

D = Disagree SD = Slightly Disagree SA = Slightly Agree A = Agree

2) Vocational versus Academic Education:

Murray (2008, p. 150) posits, “Giving high school students the option of taking [vocational] technical courses increases the likelihood they will graduate from high school.” Nonetheless, there are large numbers of students who do not have the interest or desire to successfully pursue the academic track.

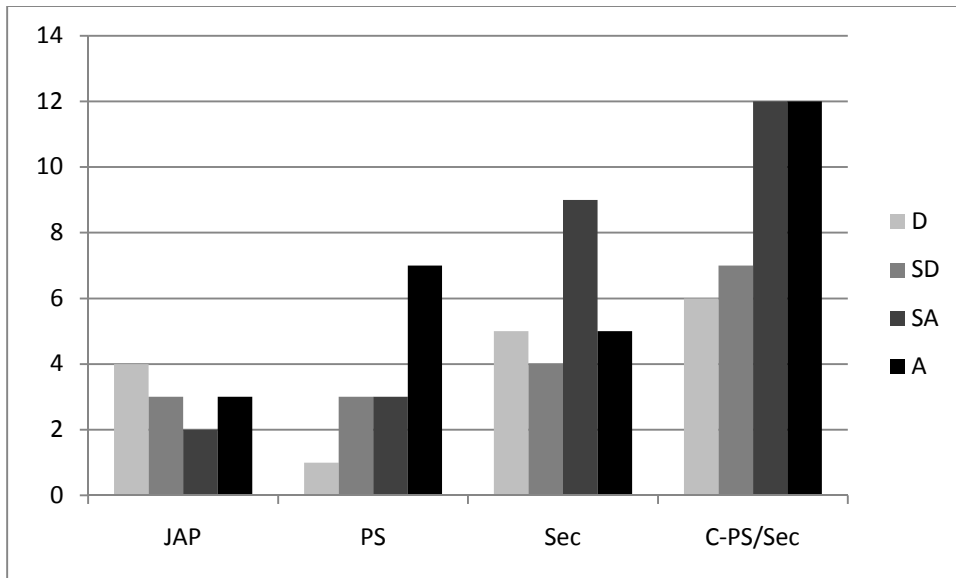


Findings: The FIG model indicates that the Japanese participants were much less inclined to agree with—the notion that many students are not interested in pursuing traditional post-secondary education than—the US participants by a margin of 1.00 to 1.5946, respectively.

Commentary: Crawford (2010, pp. 204-205) argues, “There may be something to be said, then, for having gifted students learn a trade, if only in the summers, so that their egos will be repeatedly crushed before they go on to run the country.” In this author’s opinion, the numerous industry-related reports, over the past few years, indicating the impending shortage of skilled workers (i.e., pilots, nurses, construction workers, etc.) in the USA is evidence that society and the educational system needs improvement when it comes to balancing the reality of the wants, needs, and desires of the supply versus the actual demands in the marketplace. Interestingly enough, Downie (2011, p. 1) insists, “The expansion of this system [vocational education] is considered vital for a nation [Brazil] in desperate need of skilled workers.” Conversely, Rich (2011, p. 1) asserts, “Obama has instead made it a priority to raise overall academic standards and college graduation rates, and aims to shrink the small amount of federal spending for vocational training in public high schools and community colleges.” Make no mistake, there are those who would suggest that this aforementioned Obama Administration strategy is a means of avoiding the creation of an educational caste system—wherein, low-income and minority students are diverted from college-prep courses (Goldstein, 2011). Nonetheless, Hagerty (2011, p. A1) declares, “Even with unemployment near 9 percent, manufacturers are struggling to find enough skilled workers...”

3) Tenure & Accountability:

Taylor (2010, p. 204) insists, “The single most important factor preventing change in higher education is tenure.” Consequently, it makes little sense for a school [university] to make lifetime commitments to faculty whose performance cannot not be predicted or modified.

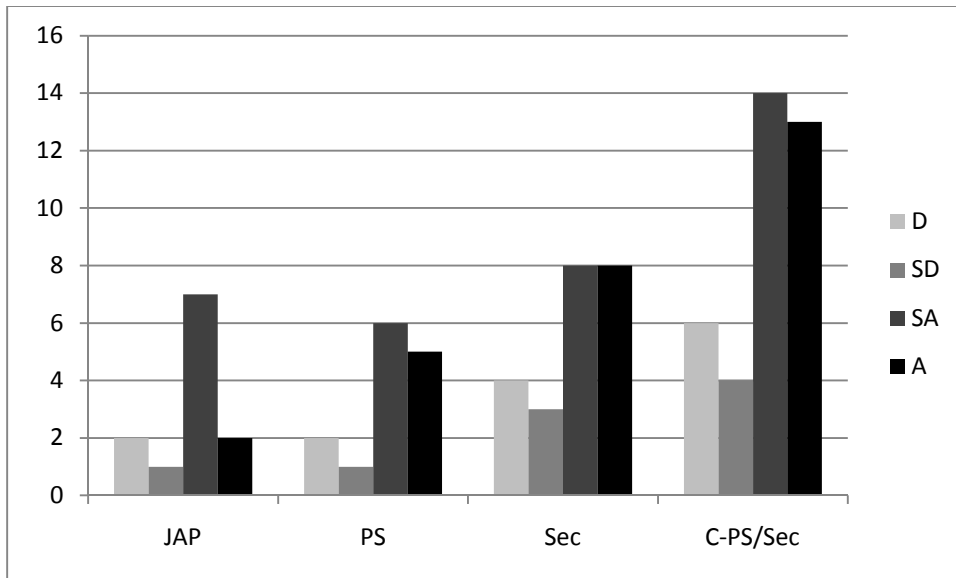


Findings: The FIG model shows that the Japanese participants were much less inclined to agree with—the concept of providing tenure to faculty members where means for accountability is seemingly non-existent than—the US participants by a margin of -0.2500 to 0.4595, respectively.

Commentary: Rarely does a week go by in the USA without another report attacking its dismal educational systems and/or outcomes. In this author’s opinion, comments, such as those provided below, indicate the need for change within the teaching profession...if it is ever to be seriously viewed by the general public as a true profession—not unlike medicine. Accordingly, Loewenberg Ball and Forzani (2011, p. 21) state, “Whereas other professions have been able to decompose practice, agree on the most important knowledge and skills, and develop, support, and assess them, teaching has not.” Furthermore, Thomas and Wingert (2010, p. 25) posit, “In no other socially significant profession are the workers [teachers] so insulated from accountability.” More specifically, Arum and Roska (2011, p. 130) purport, “Unlike elementary and secondary teachers, college professors have typically not received formal training in instruction that has emphasized the pedagogical functions of educational expectations.” It is only a matter of time before the US Department of Education imposes NCLB-like metrics on post-secondary institutions. To this end, post-secondary institutions could learn from K-12 educators, as McDermott (2011, p. A4) cites, “Some say the new cooperation by [teacher] unions is at least partially owed to a fear that unless they come to the table, they may face more drastic measures.”

4) Generational Work Ethics:

Wagner (2008) proclaims today's college students crave dignity in their work. To this end, these young people have a different kind of work ethic...one where employers must make work more interesting and allow young workers to work differently.

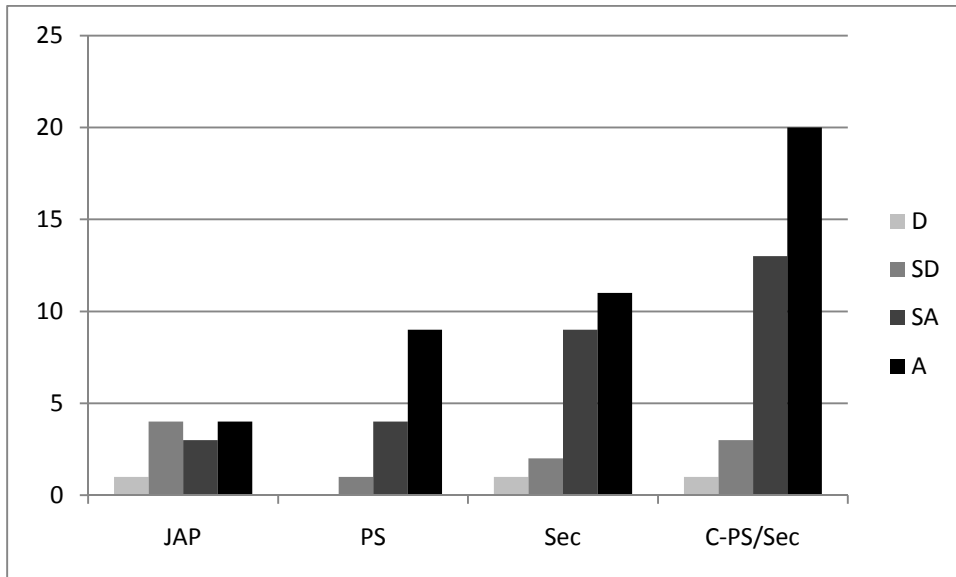


Findings: The FIG model illustrates that the Japanese participants were less inclined to agree with—the belief that employers must cater to today's younger workers in a different manner than—the US participants by a margin of 0.500 to 0.6486, respectively.

Commentary: Emeagwali (2011, p. 23) advocates, "...Millennials are forcing established systems, be it education, the workplace, or corporate America, to take them seriously; to reevaluate how they do business in order to accommodate what is the first digital generation in recorded history." From a traditional (passive) standpoint, Crawford (2010, p. 148) promotes, "We are born into cultures, which teach us how to see, speak, and think." However, from a progressive (proactive) viewpoint, Aldrich (2011, p. 147) claims, "Children are not raw materials to be made into productive citizens by 'the system'." In this author's opinion, today's college graduates have been disillusioned by a seemingly endless recession, wars, and natural disasters that have negatively impacted people who they viewed as secure in their careers. Therefore, this generation's expectations differ considerably (leaning towards obtaining immediate gains/entitlements due to the reality that longevity no longer equates to loyalty/rewards) and are cause for conflict. As Emeagwali (p. 23) notes, "While many Millennials think they have what it takes to succeed in college, many find out they don't when they get there, and are shocked by that realization." Not surprisingly, Godofsky, Zukin, and Van Horn (2011, p. 19) found, "Just 17 percent of recent college graduates expect their generation to do better than their parents' generation."

5) Globalizing Education:

Wildavsky (2010, p. 151) asserts, "...the growth of online postsecondary education around the world has been enormous—it makes up some 15 percent of all higher education globally." Hence, "The emerging face of educational globalization is one marked more and more by fluidity, mobility, and meritocracy" (p. 169).

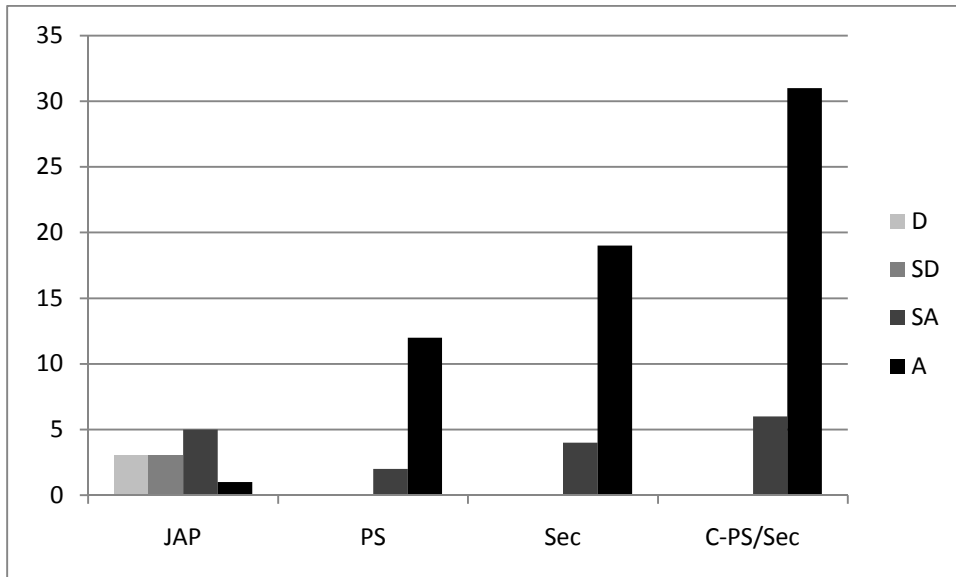


Findings: The FIG model demonstrates that the Japanese participants were much less inclined to agree with—the idea that as education spreads across the global it must be flexible and relevant than—the US participants by a margin of 0.4167 to 1.2973, respectively.

Commentary: In this author's opinion, if one accepts the notion that higher education is a key to workplace success, then it will be of utmost importance to continuously update the educational system in a manner that meets the needs of a mobile society and demanding customer/client base of nations and employers. Hence, Aldrich (2011, p. 127) proposes, "With the presence of online universities, growing virtual communities, high-value open-source content, and emerging portfolio and other 'credit for real world experience' programs, the illusion of the inevitability of a conventional undergraduate education is finally shattered...the value-proposition is challenged." Conversely, Heyneman (2011) contends that there needs to be a concern with the ethical infrastructure of international higher education due to the proliferation of fraudulent student and faculty records, credentials, etc.

6) Public Officials & Private Agendas

Ravitch (2010, p. 200) notes, “There is something fundamentally antidemocratic about relinquishing control of the public education policy agenda to private foundations run by society’s wealthiest people...” Therefore, public officials should be sure that they understand the full implications of the foundations’ strategies before doing so.

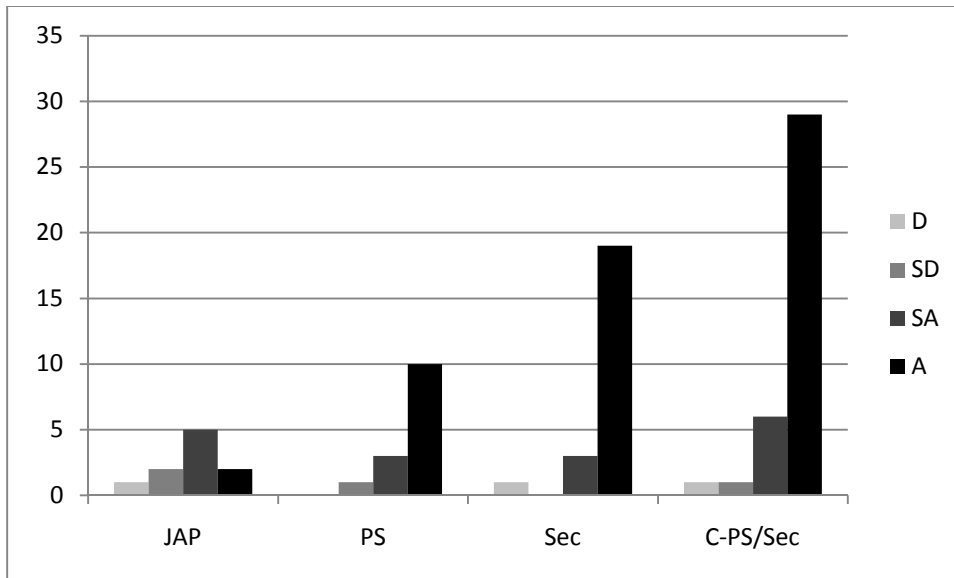


Findings: The FIG model depicts that the Japanese participants were much less inclined to agree with—the opinion that elected officials comprehend the long term effects of special interest groups than—the US participants by a margin of -0.1667 to 1.8378, respectively.

Commentary: Riley (2011, p. A11) cites the following theme derived from a recent interview with Bill Gates, “Instead of trying to buy systemic reform with school-level investments, a new goal is to leverage private money in a way that redirects how public education dollars are spent.” In the author’s opinion, right or wrong, funding from large foundations (i.e., Broad, Gates, etc.) has a tendency to sway public discourse on pertinent topics such as educational reform. To this end, Ramirez (2010/2011, p. 58) cautions, “Policymakers should have learned from the recent fiasco on Wall Street. The grotesque behavior of unrestrained, greed-driven individuals led to immoral and illegal activities that have caused suffering around the globe.” Not long after the release of the 2010 movie, *Waiting for Superman*—which became a touchstone for proponents for major educational reform in the USA—Upton, Amos, and Ryman (2011, p. 5A) found, “Many teachers...justified cheating [on standardized tests]...as a way of getting back at a low-paying system rigged by impossible standards, and unrealistic goals. Other teachers resented that their entire reputation could hinge on a child’s performance on a single day.” Ironically, in the backyard of one of the USA’s highest profile educational reformers (Michelle Rhee), Toppo et al. (2011, p. 7A) notes, “In Washington, D.C., 52 schools have been flagged at least once in the past three years because of high erasure rates on standardized tests.”

7) The Career & Technical Education Pathway:

Symonds (2010, p. 17) suggests, “It is long past time that we broaden the range of high-quality pathways that we offer our young people, beginning in high school.” However, CTE, for all its potential, is often demeaned by the nation’s elite.



Findings: The FIG model portrays that the Japanese participants were much less inclined to agree with—the attitude that influential adults are limiting proven options for high school students than—the US participants by a margin of 0.4167 to 1.6486, respectively.

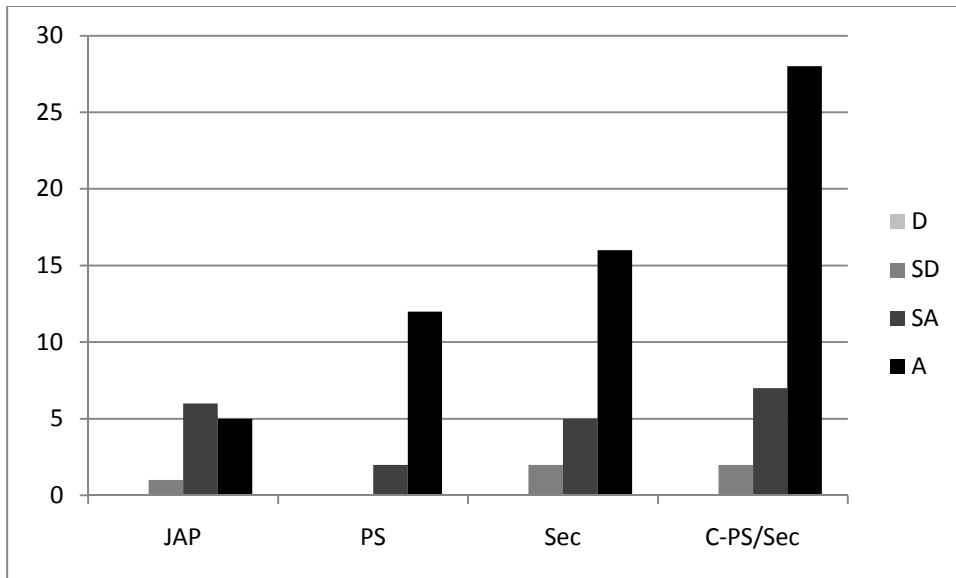
Commentary: Goodwin (2011, p. 1) reports that Mike Rowe (the star of the *Dirty Jobs* TV show) recently testified before Congress. In this author’s opinion, the following statements provided the most impact:

- 1) “Cultural prejudices against tradesmen with “dirty jobs” are holding both young people and the nation’s economy back;” and
- 2) “We’ve elevated the importance of ‘higher education’ to such a lofty perch that all other forms of knowledge are now labeled as alternative.”

Curiously, Godofsky, Zudin, and Van Horn (2011, p. 9) posit, “The depressed economy and high levels of unemployment encourage people to be grateful for what they can obtain in the job market, even if it is not what they had hoped for when they entered college.” Consequently, it is incumbent upon parents, educators, and community/spiritual leaders to take active, coordinated roles in developing school and industry-based partnerships for the benefit of high school students. Accordingly, Jusko (2011) promotes the Apprenticeship 2000 model—developed by Blum near Charlotte, NC.—wherein, local high school students are recruited to enter a Department of Labor-approved machinist program coupled with an Associate’s degree in manufacturing technology.

8) Teachers & Effective Professional Development:

Stewart (2010/2011, p. 18), declares, “21st century learners need 21st century teachers who...can create the learning environments that enable their students to develop such skills.” To this end, “Regular professional development is essential for effective teaching and learning” (p. 19).

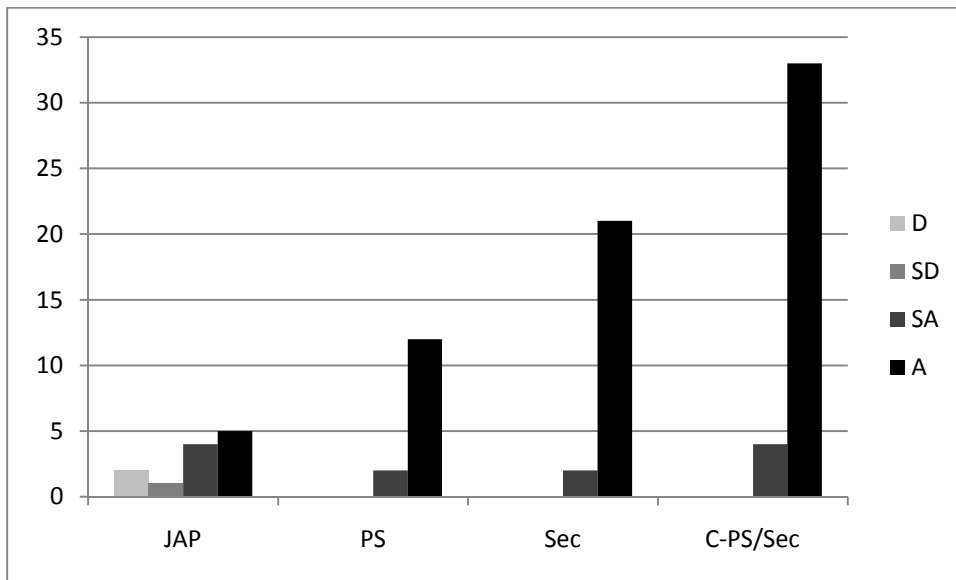


Findings: The FIG model suggests that the Japanese participants were less inclined to agree with—the position that educators must hone their skills in order to improve student learning than—the US participants by a margin of 1.250 to 1.6486, respectively.

Commentary: In this author’s opinion, only a few contemporary teaching strategies can be viewed as effective due to a myriad of factors, including but not limited: lack of empirical evidence, teacher turnover, lack of continuous funding, lack of support from administration, politically-motivated changing benchmarks, etc. Therefore, some educational professionals have turned to international models of success. To this end, since Finland emerged in 2000 as the top-scoring OECD nation on the PISA, researchers have been pouring into the country to study the so-called ‘Finnish miracle’ (Sahlberg, 2011, p. 34). Wherein, Sahlberg (p. 35) asserts, “There are no alternative ways to receive a teacher’s credential in Finland. The selected, highly capable candidates...complete a rigorous teacher education program at the government’s expense.” Whereas, in the USA, Robelen (2011) describes an effort by the Woodrow Wilson National Fellowship Foundation, wherein, STEM (fellows) teachers are being prepared and mentored to ensure deep subject/content knowledge and mastery of pedagogical skills. To be sure, one must balance the impetus to take programs such as this to scale versus the need to customize a program to meet the demands of the local school district.

9) Change & Social Responsibility:

When it comes to the concept of social capital, Nagashima (2010, p. 96) asserts, “With respect to the relationships between civic involvement, economic development, and public welfare...greater civic involvement is a function of progress in economic development.” Thusly, “The need for workers to update skills will be a continual challenge to business leaders, educators, the government and job training programs into the future” (ACTE, 2010, p. 2).

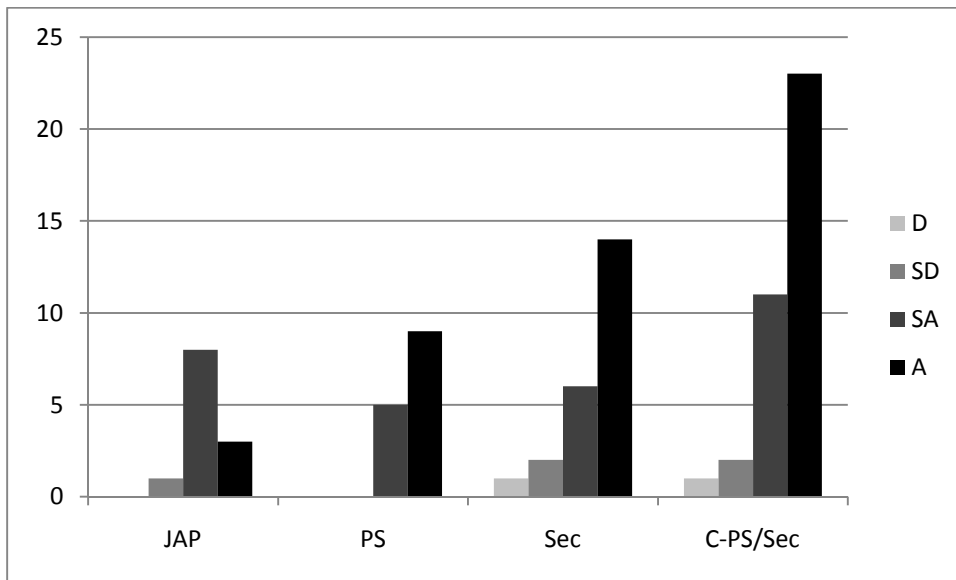


Findings: The FIG model implies that the Japanese participants were much less inclined to agree with—the stance that multiple (public and private) parties need be concerned with the links between economic development, employment, and on-going, relevant education than—the US participants by a margin of 0.750 to 1.8919, respectively.

Commentary: Long ago, Marx and Engels (1848, p. 20) advocated, “...the modern working class, ...a class of laborers, who live only so long as they can find work, and who find work only so long as their labor increases capital.” From a more contemporary era, Spence (2011, p. 32) submits, “The overall picture is clear: employment opportunities and incomes are high, and rising, for the highly educated people at the upper end of the tradable sector of the US economy, but they are diminishing at the lower end.” However, Spence (p. 39) goes on to declare, “As important as education is, it cannot be the whole solution; the United States will not educate its way out of its problems.” In this author’s opinion, STEM represents an area of common ground for all interested parties to participate. Unfortunately, not all stakeholders have been afforded an equal opportunity to provide input on selecting the winners and losers (programs, institutions, sectors, etc.) within their regions. With Congress’ laser-like focus on jobs creation, there are 60,000 foreign students graduating from US colleges with STEM degrees annually who are subjected to visa caps. In fact, Goodison (2011, p. 1) cites, “Immigrants start companies here at greater rates than native-born Americans and are disproportionately more successful in starting high-growth, high-tech firms...”

10) Outsourcing & Repositioning Talent:

Yamamura, Isa, and Saito (2010), indicate that Japanese firms have been forced to turn to China—for their young and cheap labor—in order to increase efficiency. As a result, when it comes to outsourcing talent, “...workers are forced to do more with less not only at work but during their free-time so as to constantly reposition themselves and stay relevant in the marketplace” (Gaal, 2009, p. 5).



Findings: The FIG model intimates that the Japanese participants were less inclined to agree with—the perspective that workers must constantly recreate themselves or be replaced in some fashion than—the US participants by a margin of 1.0833 to 1.4324, respectively.

Commentary: Murray and Izzo (2011, p. A2) affirm, “More than one in three of the unemployed workers in several of the largest US states have been out of a job for more than a full year.” In this author’s opinion, no job—blue- or white-collar—is immune from the effects of globalization. To this end, complacency (even while fully-employed) is a prescription for obsolescence. In a world where profits equate to survival, managers will continually seek means and methods to cut expenses...often, the largest of which are labor costs. Interestingly enough, MERIC (2011, p. 7) insists, “There is still a high employer demand for individuals in the labor force with middle-skills.... As the economy begins to recover, more Americans will need the education and training for employment in the new middle-skill growth occupations.” Accordingly, this category of jobs:

- 1) Often require something more than a high school diploma but less than a four-year college degree; and
- 2) Make-up over 40 percent of Missouri’s labor force (MERIC, p. 2).

Ironically, this speaks to President Obama’s recent comment that, over the next 10 years, approximately 50 percent of the new jobs will require some level of post-secondary education: from a one-year technical training certificate through a formal four-year college degree (Stewart, 2011).

RESULTS: Collective Analysis

Upon analyzing the collective data, using data in both Appendices A and C, it was determined that there is a significant difference between the Japanese participants' (experimental group) and the US participants' (control group) responses to the survey questions regarding their perceptions of contemporary secondary and post-secondary educational issues. As noted, a one-tail t-test for independent samples with .01 probability was utilized (Refer to Appendix C for more details).

CONCLUSION

In this study, Japanese and US educators' perception of 10 contemporary secondary and post-secondary educational topics were examined and compared. When the topics are viewed in a disaggregated manner, the findings suggest that in only one area (Question 1)—college-educated workers will gain the most in a knowledge-based economy—did Japanese participants appear to be more inclined to agree than US participants. Meanwhile, findings from Questions 2, 4, 8, and 10 suggest the Japanese participants were less inclined (as revealed by a differential margin of less than 0.5) to agree than US participants. And, results from Questions 3, 5, 6, 7, and 9 indicate that Japanese participants were much less inclined (as revealed by a differential margin of more than 0.5) to agree with US participants. To be sure, cultural differences may be a factor in these differences...not to mention the smaller (and, from an occupational perspective, less diverse) Japanese sample size due to language translation issues. These factors should be considered if additional research is to be performed.

From an inferential standpoint, as the statistical analysis (t-test) reveals in the preceding section, perceptions of Japanese and US educators were significantly different as evidenced by the aggregated data analyzed in Appendix C. To be sure, the author acknowledges that an experimental or longitudinal approach may suggest other findings and would be interested in performing further research.

In closing, the effects of globalization and the recent recession have impacted countries across the globe. On one hand, in a positive sense, borderless technologies have been incorporated to increase efficiencies, decrease labor costs, etc. On the other hand, in a negative sense, traditional living-wage jobs are lost as they migrate to lower-cost economies. The convergence of these conflicting issues is cause for concern as a country's human capital cannot rest on its past accomplishments. Therefore, the P-20 educational system will play a major role in keeping a country's economy competitive. However, it is the parts of this system that are under stress due to budget shortfalls, lack of accountability, a misguided focus on inputs/outputs versus outcomes, etc. Accordingly, new approaches to delivering education (and training), measuring teaching and learning effectiveness, and broadening the scope of eligible providers must be seriously considered. To this end, it will also be incumbent upon parents (and community leaders), in Japan and the USA, to re-evaluate their long-standing bias towards career and technical education while, concurrently, resisting the urge to bankroll anecdotal school reform efforts. Herein, the government needs to take a leadership role in establishing business / industry / labor / community partnerships that collectively addresses the needs of the local community, region, and nation. Decidedly, Stoner, Bird, and Gaal (2011, p. 29) remark, "Education and training is a vital part of

any employer's business today and education and training will increase and maintain the competitiveness of a skilled workforce.”

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APPENDIX A

The FIG Model

The FIG model utilizes scores derived from an original survey—based on the Likert Scale—as described below:

Disagree = SD = -2

Slightly Disagree = D = -1

Slightly Agree = A = +1

Agree = SA = +2

$$\sum D_{Raw} / \text{Total Participants Group...} * -2 = D_{Weighted}$$

$$\sum SD_{Raw} / \text{Total Participants Group...} * -1 = SD_{Weighted}$$

$$\sum SA_{Raw} / \text{Total Participants Group...} * +1 = SA_{Weighted}$$

$$+ \frac{\sum A_{Raw} / \text{Total Participants Group...} * +2 = A_{Weighted}}$$

$$\text{Total Group...} = \text{Score}_{Weighted}$$

For example (Question #1—Duncan):

Raw Scores

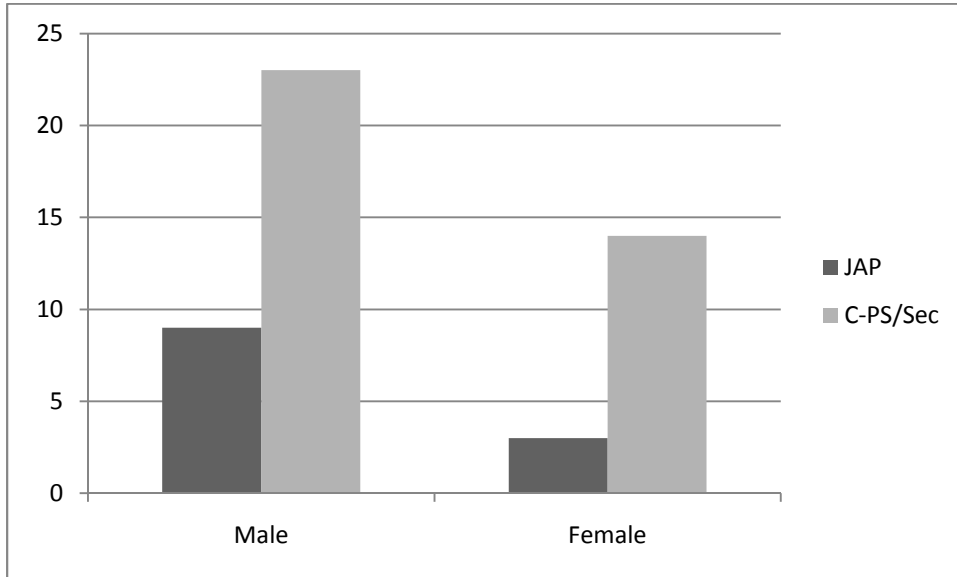
	Group			Group
	JAP	PS	Sec	C-PS/Sec
D	0	0	2	2
SD	1	0	5	5
SA	3	2	9	11
A	8	12	7	19

Weighted scores

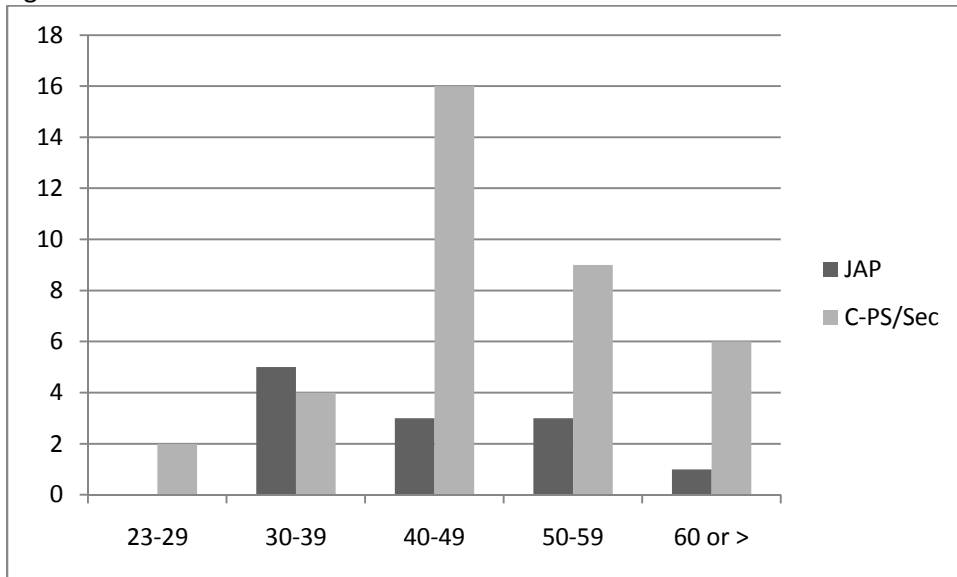
D	0	-0.10811
SD	-0.08333	-0.13514
SA	0.25	0.297297
A	1.333333	1.027027
Total	1.5000	1.0811

APPENDIX B
DEMOGRAPHICS

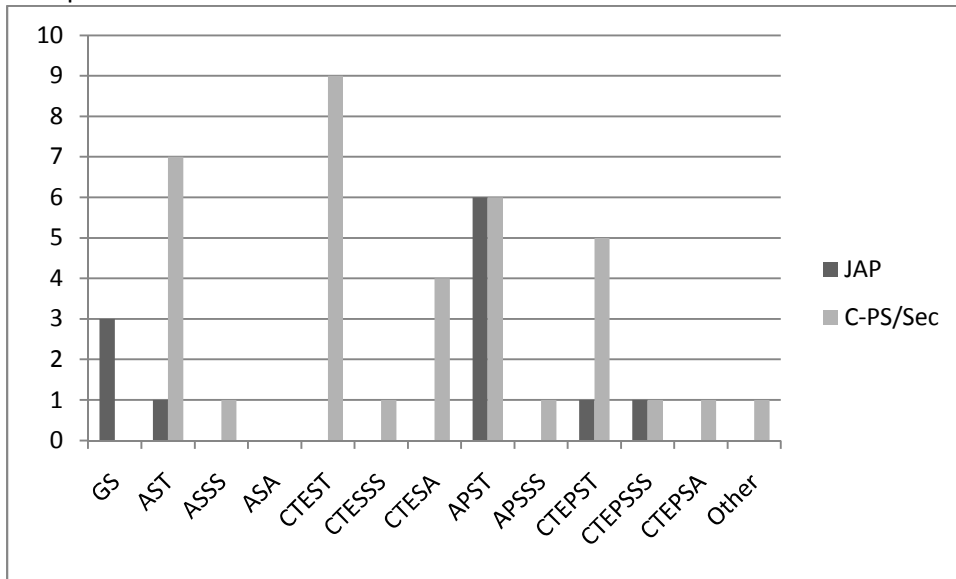
Gender



Age



Occupation



Key:

- GS Graduate Student
- AST Academic Secondary Teacher
- ASSS Academic Secondary Support Staff
- ASA Academic Secondary Administrator
- CTEST Career and Technical Education Secondary Teacher
- CTESSS Career and Technical Education Secondary Support Staff
- CTESA Career and Technical Education Secondary Administrator
- APST Academic Post-Secondary Teacher
- APSSS Academic Post-Secondary Support Staff
- CTEPST Career and Technical Education Post-Secondary Teacher
- CTEPSSS Career and Technical Education Post-Secondary Support Staff
- CTEPSA Career and Technical Education Post-Secondary Administrator

APPENDIX C

T-test for Independent Samples

	<u>JAP_(Experimental)</u>	<u>C-PS/Sec_(Control)</u>
Mean*	0.6500	1.3540
Standard Deviation	0.5784	0.4872
Variance	0.3346	0.1119
Participants	12	37

$$t = \frac{.65 - 1.354}{\sqrt{\frac{(12-1) \cdot .3346 + (37-1) \cdot .1119}{12 + 37 - 2}} \left(\frac{1}{12} + \frac{1}{37} \right)}$$

$$t = \frac{-0.704}{\sqrt{\frac{3.6806 + 4.0284}{47} (.0833 + .0270)}}$$

$$t = \frac{-0.704}{\sqrt{0.16402 (.11036)}}$$

$$t = \frac{-0.704}{0.13454}$$

$$t = -5.2326$$

$$t_{\text{Critical}(.01, 60)\text{One Tail}} = 2.390$$

5.2326 > 2.390 (There is a significant difference)

*Refer to Appendix A for calculating Weighted Scores