When reviewing the role of self-awareness and evaluation in the competency development process, it is necessary to know who has experienced self-awareness and what is experienced. Table 3 reveals that the participants' behaviours (I28), accomplishment (I21), self-affected ambition (I14) and cognitive contents (I12 and I7) were the objects of the reflective self-awareness and evaluation practise.

Table 3 Descriptive statistic for five items loaded to the first-order construct SAE

	Item	Group	n	Mean	SD
28	I really ascertain about the impacts of my behaviours on my development progress	Student	568	4.23	0.64
		Alumni	488	4.17	0.60
21	I can tell whether I possess the proper competencies to gain a job	Student	568	4.38	0.84
		Alumni	488	4.50	0.81
14	It is important for me to find another more challenging task after accomplished a certain goal	Student	568	3.93	0.73
		Alumni	488	3.94	0.69
12	When I find a difficult problem, I won't give up but actively seek a solution	Student	568	4.55	0.77
		Alumni	488	4.63	0.68
7	I have no problem to stick with my development's aims and goals	Student	568	3.83	0.79
		Alumni	488	3.90	0.72

Note. The responses were obtained through the 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree)

Table 3 indicates that the role of self-awareness in competency development process were positively addressed by the participants of this study. The responses to the five items in the SAE construct also reflect how the participants' consciousness have shaped their self-awareness and provides necessary evaluations. Thus, self-awareness emerges from situations where an individual conducts a personal evaluation related to his/her responsibility in navigating competency development. This sense of self-awareness is one of the major keys to improving the competency development process. By implication, to create effective development process, the learners' interest should be shifted into a level where could develop an awareness of the necessary approaches in managing the process. However, the effectiveness of the development process is not solely depend on these particular three constructs only, but also influenced by another construct, namely: self-management.

Self-management has become an important topic in recent years as globalisation issues have forced job seekers to actively engage in the competency development processes for effectively managing their careers. The central component of self-management is the willingness of a learner to take proactive responsibility for managing competency development regarding his/her future career. Interestingly, the obtained responses reveal that the student and alumni participants have different opinions about Self-management (Table 4).

Table 4 Descriptive statistic for three items loaded to the first-order construct SM

	Item	Group	n	Mean	SD
41	I could undertake my development better if received more support from my friends	Student	568	3.53	1.15
		Alumni	488	2.86	1.22
40	I could undertake my development better if received more support from my family	Student	568	3.44	1.19
		Alumni	488	2.88	1.23
42	I could undertake my development better if received more support from my instructors	Student	568	3.56	0.96
		Alumni	488	2.91	1.13

Note. The responses were obtained through the 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree)

From Table 4, we can see that most of student participants were lack of proactive capability to individually manage their engagement in competency development as their range of mean scores was 2.86 to 2.91 which is below the median point. This analysis also indicated that they showed a high level of dependency on their friends (responses to I41), families (responses to I40) and instructors (responses to I42). Unless learners can demonstrate proactive actions in managing their own personal competency development process, they are less ready for navigating the process.

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By contrast, the range of mean scores of the alumni participants were 3.44 to 3.56 or above the median point, indicated that most of them have developed self-management behaviours in their competency development. The alumni responses to I40, I41 and I42 indicate that the alumni participants felt a greater sense that SR is an integral part of themselves, expressed through their capability to be self-initiated, highly persistent, motivated and independent in navigating their competency development without relying on their friends, families or instructors.

4.3 Comparative analysis

In this paper, we applied t-test and ANOVA as the methods of comparative analysis in examining the strong relationship between the opinions of the participants related to the role SR in competency development process and their gender (*H1*), age (*H2*), level of education (*H3*), location of current competency development (*H4*), location of previous competency development (*H5*) and parents' education background (*H6*). The results of these analyses are presented as follows:

(1) There is no statistically significant gender effect on the perceptions of SR [$t(1054) = -1.68$, $p = 0.09$]. To provide stronger evidence, we separately applied another independent t-test to the two groups of participants (students and alumni). However, the results still indicate non-significant differences between gender and the group of participants [Student: $t(568) = -1.74$, $p = 0.025$]; [Alumni: $t(488) = -1.18$, $p = 0.08$]. Therefore, the hypothesis (H1) that the gender has effect on the perceptions of the participants about SR was rejected.

(2) Despite significant difference in the perception of SR between groups of alumni and student [$F(1, 1046) = 21.5$, $p = 0.001$], the results of the two-way ANOVA test reveals differences in the perceptions of SR of students and alumni participants over five age groups [$F(4, 1046) = 2.8$, $p = 0.02$]. However, both effects of the size were small and very weak (partial $\eta 2$ were 0.02 and 0.001, respectively). Another result also shows that the interaction effect was not statistically significant [$F(4, 1046) = 0.4$, $p = 0.81$]. This finding of no-interaction effect was supported by the results of post hoc test using Turkey HSD which stipulated that there were no significantly differences among the mean scores in all age groups. Thus, this finding was simply interpreted as the perceptions of SR between students and alumni participants were not influenced by their groups of age. Consequently, H2 was rejected.

(3) With respect to the levels of education, this study shows that there was significant relationship between the main effect of participants' group [$F(2, 1046) = 20.94$, $p = 0.001$] and levels of education [$F(4, 1046) = 13.38$, $p = 0.001$] on the perceptions of SR with a strong effect for group related differences (partial $\eta 2 = 0.05$) and weak effect of education levels (partial $\eta 2 = 0.05$). However, the interaction effect [$F(4, 1046) = 0.97$, $p = 0.421$] presented in Table 5.12 was not statistically significant. Thus, H3 was rejected or we can say that the various level of education have no effect on the perception of SR for students and alumni

(4) The two-way ANOVA test indicates a significant interaction effect [$F(5, 1043) = 5.94$, $p = 0.001$] of recent experiences on the development process influencing the perceptions of students and alumni participants about SR with large effect size (partial $\eta 2 = 0.13$). In addition, a separate one-way ANOVA test was employed to examine the nature of this effect. At probability level 0.05, the differences on the perceptions of SR for the seven schools on groups of students [$F(6, 561) = 8.75$, $p=0.001$] and alumni [$F(5, 482) = 40.1$, $p = 0.001$] were statistically significant. Correspondingly, the results of the post hoc test using Tukey HSD which examines the significant difference between the mean score of students and alumni participants within seven participating schools. For example, when learners participating in competency development in School A, they tends to have a significant higher perception of SR than those who developing their competencies in Schools D and E. However, there were no perception differences between students from School A and B. Thus, the finding is simply interpreted as *the current experience of competency development has positively influenced students and alumni on their perceptions of SR* and H4 was accepted.

(5) The result of the independent t-test at $p < 0.05$ in Table 5.16 indicate no significant difference in the student group regarding the perceptions of the participants who graduated from Australian high schools ($M = 65.01$, $SD = 10.16$) and those who graduated from non-Australian high schools ($M = 66.67$, $SD = 10.54$; $t(566) = 1.867$ $p = 0.06$). However, the results of the t-test at $p < 0.05$ for the alumni group show that the difference between alumni participants who graduated from Australian High Schools and from non-Australian High Schools was significant [$t(453.93) = 3.67$, $p = 0.001$] with a large effect ($\eta 2 = 0.37$). These results created a confusion particularly in determining whether learners' previous development experiences have affected their perceptions about SR or not. Therefore, we separately conducted an independent t-test using a combination of both group responses as the data. The result of this t-test reveals no difference in the perception of SR from the participants who graduated from

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Australian high schools (M = 69.11, SD = 10.69) and non-Australian high schools (M = 68.91, SD = 10.69; t(1054) = 0.29 p = 0.77). Therefore, H4 was also rejected.

(6) The results of the ANOVA test reveal no significant differences on the mother's education background [F(5,1055) = 1.67, p = 0.14] or father's education background [F(5,1055) = 5.05, p = 0.10] at the probability level of 0.05 in the perceptions of SR. Thus, H6 was rejected and the finding was interpreted as the capacity for accepting SR is driven by learners' own willingness, not their parents.

The results of the comparative analyses provide evidence that the opinions of students and alumni related to SR are not influenced by their gender, age, level of education, prior development experience or parent's educational background differences. This means that older and more experienced respondents may have a higher awareness of SR, but this kind of awareness does not make them automatically develop SR during the process of developing appropriate competencies. Indeed, the different interests of individuals in accepting SR are not related to their gender, age or levels of education, but to learners' current experience in the competency development process. When Candy (2004) examined the effect of learning environments on learners' capability to construe knowledge, he emphasised the transformation of knowledge from one domain to other domains. Therefore, when a learner experiences a new event, the new obtained knowledge may support or oppose his/her previous understanding of a particular subject. In several cases, this new knowledge may provide a new motivation or willingness (Oliveira, Silva, Guglielmino, & Guglielmino, 2010). Therefore Brookfield (2012) argues that the structures of understanding are obtained from how well learners construe the events. For those who are experiencing Australian engineering schools as new places to develop their competencies, the new understanding of SR in their current development environment, depending on their interpretation, may become a support or barrier for them to possess appropriate competencies.

5. Conclusion

This study has outlined the perceptions of the Australian engineering student and alumni about the role of SR in their employability competencies development process. The results of statistical analyses positively support the importance of SR and its four factors in the process of assisting students to find their own approaches in managing their own competencies development. With respect to this capability, the participants also have a common perspective about the freedom to manage their own development process along with the consequences. This sense of freedom is easier to be conceptualised than to be implemented in real development situations. For learners who come completed high school overseas, the freedom to self-manage the development process is probably a new concept. For years, they have depended on teachers/instructors in managing their personal development where all learning decisions were made by other persons. Therefore, learners' role was to passively wait to be directed by the others and fail to effectively engage in competency-enhancing activities.

This failure was shown by some student participants, particularly those who were new to the engineering school environment. Unless they could less-depend on their friends, instructors and institutions, they could not fully exercise the concept of SR in their own development process and may easily give up when confronted by perceived barriers. In contrast, self-responsible learners could develop their own approaches for effectively managing their own development process. This capability was demonstrated by the alumni participants who had internalised/integrated their external motivations into positive behaviours associated with being self-responsible learners, such as: self-organise, self-control, self-regulate, self-confidence and self-reflective. At this stage, the alumni participants understood the importance of SR for their competencies development process and transformed the concept of SR into their own development philosophy. As a consequence, the alumni participants felt a greater sense that SR is an integral part of themselves, expressed through their capability to be self-initiated, highly persistent, motivated and independent in navigating their competency development without relying on their friends, families or instructors.

This finding has implications for how SR could help learners at university level to internalise their external motivations. Like the process of constructing knowledge, SR is not something that is teachable or that automatically appears during the development process. Rather, SR is a self-determined process, guided by learners' consciousness, reflected in their awareness to self-examine their own structure of their development, including their competencies weaknesses. Therefore, when an engineering school provides an effective design of constructivist instructional environments, the perceived experiences may support learners' previous experiences and, in a positive way, become a stimulus for learners to accept SR for their own development process. On the micro level of instructional design, the effect of recent experiences in the development process also point to the creation of supportive environments that enrich their prior development experiences.

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Biography

Daudi Lazarus is a fulltime senior lecturer in Department of Electrical and Information Engineering at Pontianak State Polytechnic, West Borneo, Indonesia. He earned the degree B.S (Hons). in Computer Science from Immanuel Christian University (UKRIM), Yogyakarta, Indonesia, Masters of Engineering in Computer Systems and PhD degree in System Engineering with Engineering Education as the main concentration from University of South Australia (UniSA), Australia. He has taught courses in Telecommunication System, Computer Networking, Algorithm and Programming, Computer System and Computer Organization. His research interests include employability, competencies development, andragogy, renewable energy, and micro-controller.

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