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Summary, Findings, Educational Implications & Suggestions
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Summary, Findings, Educational Implications & Suggestions

8.1.0 Introduction

All progress is born of inquiry because inquiry leads to invention. Inquisitiveness is the mother of knowledge and the methods employed for obtaining the knowledge of unknown can be termed as research. Research is a scientific and systematic search for the required information. Research comprises defining and redefining problems, formulating hypotheses; collecting, organising and evaluating data; making deductions and reaching conclusions; to determine that the conclusions fit the hypotheses formulated. Thus, research is an original contribution to the existing stock of knowledge, facilitating its progress.

In the present study, the researcher has developed and standardised an inventory to identify self-regulated learners (SRLs) from among the higher secondary students studying in Gujarati medium schools. The researcher also checked their level of EQ and CT with the help of specific, standardised tools and their respective effect on the level of self-regulation. In the previous chapters, the process of construction & standardisation of SRL inventory, collection of data and its analysis were discussed. The present chapter deals with the summary, findings its implications and suggestions for future research.

8.2.0 Summary

The main objective of the present study was to construct and standardise an inventory to identify self-regulated learners (SRLs) from amongst the Gujarati medium, higher secondary students and study the effect of area, gender, stream and standard on their level of self-regulation. The study also aimed to study the effects of Emotional Intelligence (EQ) and CT (CT) on their level of self-regulation.

The required number of null hypotheses were constructed to verify the assumptions. The growing importance of the concept of self-regulation was discussed in the light of its importance for the teachers, researchers, learners and parents. The study was delimited to higher secondary, Gujarati medium schools of Central Gujarat region. The key words of Self-Regulation, Self-Regulated Learners, Metacognition, Motivation, Behaviour, EQ and CT (CT) were defined and the dependent and independent variables were also stated in the first chapter.
The second chapter dealt with the theoretical perspective of the concept of Self-Regulated Learning and Self-Regulated Learners.

The concept of self-regulated learning was elaborated in detail with the help of classic definitions given by various experts. Common basic assumptions were drawn by studying various approaches and models of self-regulation. The three general domains (1) Cognitive (2) Affective and (3) Active were explained and the process of self-regulation was also discussed. All these discussions helped the researcher to know the essential features of self-regulated learners and finalize the three major components that learners can try to self-regulate.

All the three major components (1) Metacognition (2) Motivation and (3) Behaviour were discussed in detail, highlighting their sub-components. This helped the researcher in formulating the items on SRL inventory. The other two concepts of EQ & CT were also discussed in detail to get a clear & proper understanding of them. This helped the researcher in the study of their relationship with self-regulated learners.

The third chapter dealt with the review of the related literature. Review was done to give the study a clear, proper direction & keep it on the right track. For This purpose 10 international level studies, five national level studies and three local level studies were reviewed in detail. Over and above that 11 international and nine national studies were reviewed in brief also. The review revealed that major studies done earlier were on international level and very few studies related to the present study were carried out at the national level. While at local level, there was hardly any study done on the self-regulated learners in particular. This exercise helped in distinguishing what needs to be done from what was done earlier and also gave a clear perspective & put the hypotheses in proper context. It also helped the researcher gain good command over the methodology to be adopted for the present study.

The review also helped in knowing which factors facilitated self-regulation and which demographical variable impacted self-regulation and upto what extent. It also threw light on the role of EQ and CT in promoting self-regulation. In all, 10 international level, five national level and three state level studies were reviewed in detail. Moreover, other loosely related studies were also reviewed briefly to gain a better perspective of the work on hand. The review concluded that earlier studies were related to processes, components, synergy with creativity and motivation, some focussed on metacognition while some others were restricted to construction of inventory only. The sample size was also small and the time span was quite long. This necessitated a fresh look at the research problem.
The Fourth chapter dealt with the research methodology. It provided the blueprint for the collection, and analysis of data. This planning ensured success by minimizing bias and maximizing reliability of the study. The main objective was to identify self-regulated learners form the Gujarati medium students of higher secondary schools so all Gujarati medium higher secondary schools in the state of Gujarat became its population.

Sample size varied for different try-outs. Sample for pre-pilot study was 100 students. For pilot study and first try out, it was 400 students, selected in the pre-decided proportion for each variable. For the final run, a representative sample of 2000 students was selected from the five districts of Central Gujarat.

In all, three tools were used for data collection. Out of them, SRL inventory was developed by the researcher and for EQ & CT, two already standardized tools were used with prior permission. Actually, the other two tools were to be administered on SRLs only, but to locate SRLs after a time gap was not feasible, so all three tools were administered simultaneously to the entire sample during final run of the inventory. This process involved administering and collecting tests three times, so help of other qualified field investigators was taken. An alpha-numeric coding system was generated based on all four variables under study and all answer sheets were given district wise serial numbers. Overall 16 code patterns were generated to cover four variables and their two sub-divisions each (2x2x2x2=16). Responses were sought by selecting an alphabet representing the frequency of occurrence (SRL) and level of agreement (EQ test), For CT, free responses were sought as per test manual prepared by the test constructor.

Chapter five dealt with the process of tool construction. Three major components of Metacognition, Motivation & Behaviour were identified after review of related literature and their indicators were also listed out.

**Indicators**

**Metacognition.**

1. Active Control
2. Learning Strategy
3. Planning
4. Monitoring
5. Evaluation
6. Revising
7. Sustenance
Motivation:

1. External:
   (a) Reward
   (b) Punishment

2. Introjected:
   (a) Self-Worth
   (b) to show ability
   (c) Fear of failure

3. Identified:
   (a) Value and Importance of task

4. Integrated:
   (a) Choice
   (b) Control
   (c) Autonomy

Behaviour:

1. Self-control
2. Self-observation
3. Self-evaluation
4. Self-reaction
5. Help seeking
6. Increasing effort

According to the indicators, items were constructed to check their presence & proportion. Some items were worded negatively. Reply was sought by selecting an alphabet representing the frequency of occurrence.

The preliminary draft of the inventory was sent to the selected 11 experts from the field of Education and Psychology along with some basic theoretical information about different components. They evaluated items as per prescribed guideline given to them. On the basis of evaluation & suggestions, a preliminary draft of SRL inventory containing 104 items was prepared for pre-pilot study. Propriety of language & instructions, difficulties faced and time taken to complete were noted. The 't'-value for each item was computed and items having less than 1.96 't'-value were rejected. Remaining items were re-arranged in ascending order of their 't'-value within their respective subscale for the next level. This process was repeated for pilot study and first try out too. The final form of the SRL inventory contained 80 items (Metacognition 28, Motivation 24, Behaviour 28) in all. Responses were sought on five point scale of A, B, C, D and E each depicting frequency of occurrence or their level of agreement. Statements were worded positively and negatively. The scores assigned were 5 to 1 for positive statement and 1 to 5 for negative statement.
In chapter six, Reliability & Validity for the SRL inventory were estimated by various methods. Reliability was estimated by Test-retest Method, Split-Half method (Speerman Brown formula, Rulon formula, Flanagan formula) and Cronbach’s alpha. The value of reliability coefficient for SRL inventory ranged from 0.89 to 0.98.

Validity of the SRL inventory was estimated by Face validity and construct validity by internal consistency and factorial validity by centroid methods. (Value 0.86)

To establish norms, t value for each variable was computed. The computation revealed that only Gender (Sex) and standard had a significant effect on SRL score. So the norms were established as per gender and standard only. To know the level of self-regulation of a particular student, PR were classified in five levels and each level was assigned a letter grade of A to E revealing the level from Very good, Good, Average, Below average to Poor.

A test manual containing the necessary instructions, illustration of how to answer, scoring scheme and norm table were also prepared to facilitate future use to identify Self-Regulated Learners from the population.

Data analysis was done in chapter seven. The first step was the identification of SRLs which was done with the help of Median value. SRLs and non SRLs were then classified as per each variable (Area, Gender, Stream & Standard). All SRLs were further classified as High SRLs & Low SRLs group with the help of Median value computed on the basis of scores of all SRLs. Level of self-regulation was also established for each of the variable.

Median value was computed for EQ and levels of EQ as high & low were established on that basis. The total number in High EQ group & Low EQ group was further sub-divided as High SRLs & Low SRLs on the basis of their earlier classification. This process was repeated for each variable and classification of SRLs in the context of levels of EQ was done.

Students were also classified as High CT group & Low CT group with the help of Median value computed on the basis of scores earned on CT test. All the SRLs were further classified as High & Low CT group for each variables.

Two way ANOVA was performed to study the main effects of level of EQ, each of four variables and also the interaction effect between them. Same process
was repeated to study the main effect of level of CT & its interaction effect with each of the four variable.

The analysis revealed that level of EQ had a significant main effect on SRL scores individually and also when combined with each variable. But level of CT had no significant main effect on SRL scores either individually or jointly with any of the four variables. All the variables had no significant main effect on SRL scores individually in the light of CT. All the interaction effects, between level of EQ and level of CT on one hand and each variable on the other hand were also insignificant.

The present chapter deals with the findings, education implications, and suggestions for the future researches.

8.3.0 Findings

- The Mean and Median value of the scores earned on SRL Inventory by the entire sample were 299.915 and 291 respectively. The Mean value was slightly higher than the Median value.
- 1013(56.50%) students were identified as self regulated learners (SRLs) from the entire sample of 2000 students on the basis of Median value.
- SRLs contained more number of students from Urban area than Rural area but Mean value was higher in case of Rural students.

  In case of Non SRLs, the situation was totally reversed as it had more students from Rural area : the Mean score of non SRLs was higher for Urban than Rural students.
- Gender wise, girls were more in number than boys in SRL section and boys were more in number than girls in Non SRL section.

  Looking to the Mean scores, SRL girls have a higher Mean score than SRL boys and Non SRL boys have a higher Mean score than Non SRL girls. Both Mean differences were quite marginal.
- Stream wise, both SRL and Non SRL section had more students from General Stream. But from total number of Science stream students, SRL group had more number of students than Non SRL group. Whereas, in case of General stream, more number of students were in Non SRL group than SRL group.

  Science stream students had a higher Mean score in SRL group. But General stream students had a higher Mean score in Non SRL Group.
- More number of students from std. XII were found in SRL group while Non SRL group had more students from std. XI. But looking to the Mean scores,
students from std. XII had a higher value in both SRL and Non SRL group. The Mean difference was slightly higher for Non SRL group.

- Median value of SRL group (346) was slightly / marginally higher than their Mean value (339.73).
- SRLs were classified into two halves as High SRLs and Low SRLs on the basis of their Median value of SRL group. This classification revealed that High SRLs were less in number when compared to Low SRLs.
- There were more students from Urban area in both High SRL group and Low SRL group. But Rural students had a higher Mean score in both groups.
- Looking to the classification of SRLs in the context of gender, Girls were more in number in both High & Low SRL group and also enjoyed a marginally higher Mean value in both groups.
- Stream wise there were more number of General stream students in both High and Low SRL groups but from total number of students identified as SRLs more students were in Low SRL group than High SRL group in case of both streams. Science stream students had a higher Mean value in High SRL group while General stream students had a higher Mean value in Low SRL group.
- There were more number of students from std. XII in both High and Low SRL groups. But the difference was significant in High SRL group. The difference in Mean scores were marginal in both groups. In High SRL group, it was in favour of Std. XII students but in case of Low SRL group, the Mean was in favour of the std. XI students.
- The Mean and Median values for the entire sample, calculated on the basis of EQ, were 261.33 and 246 respectively. So, the Mean value of EQ was higher than the Median value.

  SRLs (Classified on the basis of Median value) in High EQ group were six times more in number than in low EQ group.

- High EQ group and Low EQ group of SRLs were both dominated by Low SRLs.
- High EQ group contained more number of Rural Students whereas Low EQ group had more number of Urban Students. The same pattern was repeated in case of Mean scores.
- In High EQ group, girls where more in number and also had a higher Mean value. But in Low EQ group, Boys were more in number and also had higher Mean value.
• General stream students were more in number in both High EQ and Low EQ group. But as per the original ratio of 2:3 for science and general stream students, Science stream students had a higher percentage or larger share in both High and Low EQ groups. [354 – 516 (531)] High EQ and Low EQ [68 - 76 (102)]

Science stream students had a greater Mean EQ in High EQ group whereas General stream students had a greater Mean score in Low EQ group.

• The students of standard XII were more in number as well as had higher Mean score in both High and Low EQ groups.

• The Mean and Median value of the entire sample on the CT test were 45.02 and 46 respectively. Here, the Median value was slightly higher than the Mean value unlike the SRL inventory and the EQ.

• SRLs were further classified on the basis of Median value for CT into two halves as High and Low CT group. High CT group had more number of SRLs than Low CT group. But the difference was not so huge as High and Low EQ group. High and Low CT groups were dominated by Low SRLs.

• High CT group had more number of Urban students and Low creative thinking group had more number of Rural students. But in case of mean score of SRL, Rural students had higher Mean score in both the groups.

• Gender wise, girls enjoyed a clear advantage in number as well as Mean score in both High and Low CT groups.

• High and Low - both CT groups had more number of General Stream students. But putting things in perspective of the original ratio of entire sample (2:3), Science stream students had an advantage in High CT group and disadvantage in Low CT group.

In case of mean score of SRL, Science stream had a higher score in high creative thinking group and General stream had a higher Mean score in Low CT group.

• Std. XII students were more in number and also had a higher mean score of SRL in High CT group. The position was reversed in favour of Std. XI students in Low CT Group.

• There was a significant difference in the Mean scores of SRLs between groups formed on the basis of …
  1. Level of EQ and Area
  2. Level of EQ and Gender
3. Level of EQ and Stream
4. Level of EQ and Stream
5. Level of EQ and Standard

At 01 level of significance.

• There was a significant main effect of level of EQ on SRL scores when evaluated in the light of Area.
• There was a significant main effect of level of EQ on SRL scores when evaluated in the light of Gender
• There was a significant main effect of level of EQ on SRL scores when evaluated in the light of Stream
• There was a significant main effect of level of EQ on SRL scores when evaluated in the light of Standard.
• The interaction effects between the level of EQ on one hand and a demographical variable (Area, Gender, Stream and Standard one by one) on the other hand were not significant.
• There was no significant difference in the Mean scores of SRLs among four groups formed on the basis of CT and a demographical variable. This applied to all four demographical variables of Area, Gender, Stream and Standard.
• The level of CT, evaluated turn by turn for all four demographical variables of Area, Gender, Stream and Standard also had an insignificant main effect on SRL Scores.
• Each of the four demographical variables had an insignificant main effect on SRL scores.
• The four interaction effects between the level of CT on one hand and a demographical variable on the other hand were also insignificant.
• Out of 16 Null Hypotheses farmed for the level of EQ, 8 HO₅ were found significant at 01 level of significance while the remaining 8 HO₅ were not significant.
• All four HO₅ framed to check the main effect of demographical variables (Area, Gender, Stream and Standard) on SRL Scores were found insignificant.
• All four HO₅ framed to check the two-way interaction effect of demographical variables (Area, Gender, Stream and Standard) and levels of EQ on SRL scores were also found insignificant.
• All the 16 HOs farmed for the level of CT were found insignificant. This result is an eye opener because the past studies have revealed that CT and Self Regulated learners have high correlation. This requires an in-depth, independent study to dig out the facts behind it.

8.4.0 Discussion of the findings

The findings revealed that the proportion of SRLs was more than non SRLs. Considering each demographical variable, there were more number of SRLs in Urban area, girls, science stream and std. XII. Earlier researches such as Pajeres & Valiante (2002), Zimmerman & Martinez-Pons (1990) and Pokay & Blumenfield (1990) also concluded that girls were more self-regulating than boys and they surpassed boys in goal setting, planning, strategies and self monitoring. Girls also used more cognitive and metacognitive strategies than boys. So this finding of present study is in agreement with these earlier studies. But overall, the level of self-regulation was observed to be on lower side.

Wayne T. Gordon (1996) had established a strong relationship between self-regulated learning & GPA (Grade Point Average).

Earlier researches of Humphery et.al. (2004), Parker et.al. (2007), Low & Neilson (2004), Abisamra (2000), Cleory et.al. (2008), Petrides et.al. (2004), Miglani D (2001), Sharma M (2011) Kaur M (2001), Usha & Rekha (2009), all established that EQ is a strong predictor of academic success. It promotes self-regulation and positively affects academic achievement. This was reaffirmed by the finding of the present study. Out of total number of SRLs identified in the study, 85.78% were having high level of EQ. So we can conclude that EQ is a strong predictor and key factor for SRLs.

Darsana M (2007) found that boys had more emotional understanding than girls. But this was contradicted by the finding that there were more girls in high EQ group. This finding is in agreement with the finding of Manojkumar Sharma (2011) which established significant difference between Urban-Rural and Male-Female student having high EQ.

Looking to the Creative thinking aspect, there was contradiction in earlier findings. C. K. Bhagayata (1986) concluded that boys were more creative than girls and Urban students were more creative than its counterpart. O.P. Singh (1982) had earlier found that Urban and science stream students to be more creative. Whereas, N.N. Desai (1987) found no significant difference in Creative thinking ability of Urban-Rural, Boys-Girls and Science stream – General stream students. The present study contradicted the finding that boys were more creative than Girls (251 to 279); but confirmed that Urban
students were More creative than rural (300 to 230) and science stream students (30.25%) were more creative than General stream students. (24.00%).

The study confirmed the earlier findings that EQ and CT, both promote level of self-regulation but CT alone don’t pinpoint any result.

8.5.0 Implications of the Findings

All the findings and discussions about them established the need to promote self-regulation amongst students because it leads to greater success in academics as well as in work related matters. So, the first thing which needs to be done is to identify the SRLs from the students and take necessary measures to promote self-regulation.

The SRL inventory developed by the researcher has been found to be reliable and valid, so it will prove to be useful as a diagnostic tool separating SRLs from non SRLs and also measuring their level of self-regulation.

Findings revealed that girls are more self-regulating than boys. So motivational programmes and activities & exercises which can promote self-regulation of learning in boys should be integrated with the curriculum. This would increase level & extent of self-regulation amongst boys. There were more number of SRLs amongst std.XII students which suggest that students tend to relax & take it easy in std.XI. So necessary steps should be taken to sustain the motivation and thereby level of self-regulation for Std.XI students. It is also established by earlier researches that SRL leads to greater academic success therefore more efforts should be made to spread the awareness of its importance.

Most of the SRLs were found to be having high EQ level which confirmed that EQ promotes self-regulation. So, EQ is also a very important aspect and should be given due importance while planning academic activities. Any activity that increases the level of EQ will ultimately lead to greater self-regulation. Girls were found to be having more EQ than boys in the present study which contradicted earlier finding of boys having more EQ. So remedial measures should be taken to enhance the level of EQ amongst boys.

Surprisingly CT ability of the students was found to be having very little or negligible impact on the level of self-regulation. This contradicts the earlier findings that CT plays a major role in promoting self-regulation of learning. So this needs to be verified. This could either be done by using another valid test for Creative thinking or by using the same test on a different sample. Findings also showed that there was significant difference between various sub-variables like Urban-Rural, Boys-Girls, Science stream-
General stream. So proper steps should be taken to bridge this gap and promote CT across all variables equally.

This SRL inventory has been proved to be a reliable and valid tool, so teachers in the state of Gujarat can use it to identify self-regulated learners. They can also use it as a diagnostic tool to locate the areas where they fall behind in self-regulation and plan necessary remedial measures. This tool can be used again to check the improvement.

8.6.0 Suggestions

The findings of the study and their implications offer some suggestions for all the stakeholders i.e. students, teachers, educationists and trainers. It also indicates the areas & aspects which future research work should address to consolidate the construct of self-regulation in learning.

8.6.1 General Suggestions

- The concept of self-regulation of learning and resultant benefits should be thoroughly explained to the students.

- Students should be encouraged to engage more & more in self-regulation by limiting spoon feeding and supplying readymade answers.

- Students should be made to think and make a choice on their own.

- Teachers should plan more activities which facilitate self-regulation in learning.

- Teachers can design a special programme to promote self-regulation among students and check the improvement.

- EQ is an important aspect which promotes self-regulation & leads to greater academic success, so more steps should be taken to promote EQ among students.

- The role of Creative thinking in academic setting should be probed and its impact on self-regulation of learning should be checked.

8.6.2 Suggestions for future research

Every new research is built on the foundation of some past research. Even the legendary Albert Einstein once told that he was standing on the shoulders of Sir Issac Newton. So every research paves way for some new
researches. Following are some of the ideas & topics which can be taken up for new research.

- A self-regulated learners inventory for English medium students can be developed & standardised.
- SRL inventory can be standardised for primary, secondary & UG level students.
- Test of different nature & format can be developed to measure the presence and level of self-regulation as self-report format because it has some drawbacks.
- The relationship and impact of other constructs like IQ, Socio-Economic status, Parent's Education, Stress etc on SRL can be investigated.
- Experimental programme promoting self-regulation can be designed and implemented and its effectiveness can be measured by comparing pre-performance with post performance.
- Does the level of self-regulation increase with advancing age & growing maturity? This can be studied as a separate research.
- The relationship and interaction between sub components of self-regulation can be studied independently.
- Programmes enhancing EQ and CT can be implemented and their impact on SRLs can be observed.
- The level of self-regulation of learning can be probed in differently abled children.
- A new tool to measure the level of self-regulation of Highly successful people can be developed to check the role of it played in their success.

**8.7.0 Conclusion**

In this century of knowledge, the need to be a self-regulated learner is greater than ever before as information and ways of learning are increasing exponentially. Self-regulation not only ensures academic success but also helps in becoming life-long learners. Self-regulation can be associated with success in different learning situations like formal study, online learning, sports, working environment etc.
Good news is that self-regulation is not a fixed personality trait but is a set of attitudes, approaches and skills that can be taught & developed. It is quite possible to become a self-regulated learner and also increase its level.

The present study was undertaken to identify SRLs and non SRLs with the help of a reliable and valid tool (SRL inventory). The other objective was to ascertain the effects of EQ and CT on Self-regulated learners so that follow up remedial measures can be taken up to promote them.

Due care was taken to keep the study error free and the tool relevant.

The researcher can only hope that this endeavour will inspire and motivate all the stakeholders of Education to strive for excellence in all walks of life.

May this study work as a catalyst to trigger many more useful studies pertaining to self-regulated learning and learners.