New Horizons, Vol.14, No.2, 2020, pp 175-198 *DOI:10.2.9270/NH.14.2(20).10*

CONSTRUCTIVE FEEDBACK AND STUDENTS' ACADEMIC ACHIEVEMENT: A THEORETICAL FRAMEWORK

Rabia Aslam*, and Najmonnisa Khan**

ABSTRACT

Providing constructive feedback to students is one of the most influential strategy which helps students to boost their self-efficacy, raise students' motivation for the task and improve self-regulation which ultimately help students to achieve their learning outcomes. The aim of the present study is to conduct a critical literature review survey on constructive feedback, propose a theoretical framework and build a conceptual model on the basis of reviewed literature. In this regard abstracts from journals and Dissertations were explored and scrutinized thoroughly for critical literature survey on "constructive feedback and its effects" by using search terms such as constructive feedback, academic achievement, feedback and self-regulation on Google Scholar, ERIC, Elsevier, Springer, Sage, Taylor & Francis. The search covered a total of 221 articles/ books from January 2000 to May 2020 including some older publications as well, by means of snowballing. Out of these, 92 articles were filtered and incorporated in this study. Behaviourism perspective, goal orientation theory, Expectancy value theory, and cognitive constructivist self-regulated theoretical account supported the theoretical framework for the present study and conceptual framework was proposed.

Keywords: *Constructive Feedback, Motivation; Self-Efficacy, Self-Regulation, Academic Achievement.*

INTRODUCTION

Students' academic performance not only depends on the teachers' teaching methodologies but also depends on the quality of assessment (Din

**Research Scholar, Department of Education, Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology, Karachi Pakistan.*

***Associate Professor, Department of Education, Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology, Karachi Pakistan.*

& Saeed, 2018). The standard-based education system of any country cannot be developed without alignment of assessment with educational standards (Gulzar & Mahmood, 2019). Formative assessment is a process to gather information from students which could improve their learning (Cauley & McMillan, 2010; Ghazali, Abdullah, Zaini, & Hamzah, 2020). Practice and students' engagement are the two distinct features of formative assessment (Dixson & Worrell, 2016) and providing descriptive (constructive) feedback is a key component of formative assessment (Black, Harrison, Lee, Marshall, & Wiliam, 2003; Clarke, 2003; Hattie, 2009; Reddy, 2019; Sadler 1989, 1998), as Hattie and Timperley calling it "among the most critical influences on student learning" (2007, p. 101), which motivate and keep learners busy in their work (Dixson & Worrell, 2016; Javed, 2017; William, & Black, 1996). Feedback increase learners' persistence and satisfaction (Brookhart, 2017; Kluger & DeNisi, 1996), and students embrace more approaches of fruitful learning (Reddy, 2019; Vollmeyer & Rheinberg, 2005).

Researches over the preceding decades suggest that giving constructive feedback to student is one of the most influential strategy which helps them to boost their self-efficacy (Andrade, Wang, Du, & Akawi, 2009; Panadero & Romero, 2014), to adoptive "students' motivation for task value" (Nicol & Macfarlane-Dick, 2006; Pajares, 2003; Zumbrunn, Marrs, & Mewborn, 2016) and to improve self-regulation (Cleary & Zimmerman, 2004; Thompson, Wiedermann, Herman, & Reinke, 2020; Zumbrunn et al., 2016) which ultimately help students to achieve their learning outcomes (Hattie, 2009, 2012) results the better performance in exams (Harks, Rakoczy, Hattie, Besser, & Klieme, 2014; Hattie & Timperley, 2007; Javed, 2017; Tahir, Khurshed, Ishfaq, & Gul, 2015; Maj-Stepien, 2016; Skipper & Leman, 2017; Din & Saeed, 2018).

As a concern in the Pakistani context, great attention of formative assessment practices is seen in education policies, which is incomplete without feedback. For instance, the National Professional Standards for Teachers in Pakistan (Government of Pakistan, 2009) sets standards for the teachers in which one of the key components of its 5th standard of Assessment is providing constructive feedback. By definition, "feedback is information such as knowledge, skills or attitudes provided by teachers, peers, books, parents, self or experiences of one's performance" (Hattie & Timperly, 2007), basically it is "a Consequence of performance". In Pakistan, quality of an education and students' performance is not up to the

mark and reported to be unsatisfactory (International Crisis Group, 2014; Din & Saeed, 2018). The annual report and gazette of BSEK and DOEE shows discouraging results of grade IX (Science group) and of grade VIII especially from the last three years period of 2017 to 2019. Continued lower achievements of grade IX science group from 74.16% (BS.EK, 2017) to 62.63% (BS.EK, 2019) and of grade VIII from 28.28% to 24.5% (DOE, 2018) in general science subject at Karachi region, creates a great concern for those teachers who teach at elementary or secondary level. Students do not perform well in the final assessment and feel difficulties to solve annual exams paper because no proper formative feedback practices had been followed (Ahmed, Akhtar, & Aslam, 2020).

Hattie (2009) synthesis systematic literature review of 12 earlier Meta-analyses amalgamated 196 studies and 6972 effect size, and concluded that "feedback had a powerful effect on learning outcomes". John Hattie is the biggest name in the literature available on the feedback, but from the best finding, an irony situation seems that none of the literature available which discuss the practices of any feedback model at any educational level in Pakistan (Din & Saeed, 2018, p. 10). Despite this, the local literature available, only to discuss the feedback effect, irrespective of any feedback model, on students' performance mostly in English Subject at the tertiary level. Therefore, the researcher finds a need to implement an established model of Hattie and Timperley (2007) as a framework for the present study in a science subject at the secondary level as this model allows each pupil who are dependent on their learning criteria to provide differenced and detailed input. Therefore, this study aims:

1. To critically review the past published papers on constructive feedback and its characteristics.
2. To critically review a literature available on effects of constructive feedback on students' academic achievement.
3. To propose a theoretical framework for the study on the basis of reviewed literature.

LITERATURE REVIEW

Concepts of Feedback

In 1983, Ramaprasad well- explained that feedback as information which fills the gap amid the desired level of fulfillment and a cited point. His definition also noted that the information could only be called feedback if it was used to close the gap between the two points. The

conditions necessary for providing feedback are an original reference level (or objective), a required level of attainment, and a mechanism for comparison (Ramaprasad, 1983). Ramaprasad went on to note that feedback can be on just about anything and encourages strong working relationships. Feedback in education is vast term that denotes to a response about a pupil's performance of task and is used as the hinges on academic improvement (McLaughlin, 1992). More specifically teacher feedback is a result, verbally or in written form, that comes either during the process or after students complete a task.

Parr and Timperley (2010) argued that feedback is a significant part of classroom instruction. Sadler (1998) noted that feedback is such a fundamentally distinctive aspect of responsible and responsive teaching that to have teaching and learning without feedback would be tantamount to learning without a teacher. Stronge's (2002) research showed that feedback reliably surfaces as a powerful device to support student learning.

Constructive Feedback

The literature clearly indicates that constructive feedback has the intriguing power to differentiate the level of a student's achievement (Duffy, 2013; Harks et al., 2014; Parr & Timperley, 2010). Nicol and MacFarlane-Dick (2006) argued that constructive feedback can be used to accelerate students' learning. Feedback lets students know how their performance is tracking to pre-determined goals and allows for corrections (Nyiramana, 2017), therefore, allowing for greater opportunity for overall success.

Anderson and Black (1975) Learning for Mastery (LFM) offers another persuasive argument for the delivery of constructive feedback. Constructive feedback is essential for mastery (Black & Wiliam, 2009). LFM underpins the belief that lower ability students can do if they are given greater opportunity to learn and better quality teaching. Feedback was identified as one of the key elements of the LFM strategy, and giving effective feedback is a key element of quality teaching (Ames, 1992). Feedback offers lower ability students chances to get access to better quality teaching. While the research on LFM is inconclusive, much of the research clearly identified that feedback plays a powerful role in mastery success (Guskey, 2019). The next step is to decide what makes up constructive feedback.

According to Hattie and Timperley (2007), Constructive feedback should address three main questions:

- Where am I going? – This question is answered through the provision of a clear set of goals for students.
- How am I going? – The answer to this question comes about through the delivery of effective and timely feedback.
- Where to next? – This question is also answered through effective and timely feedback – it lets students know what they have to do to meet the end goal (ref: Figure 1).

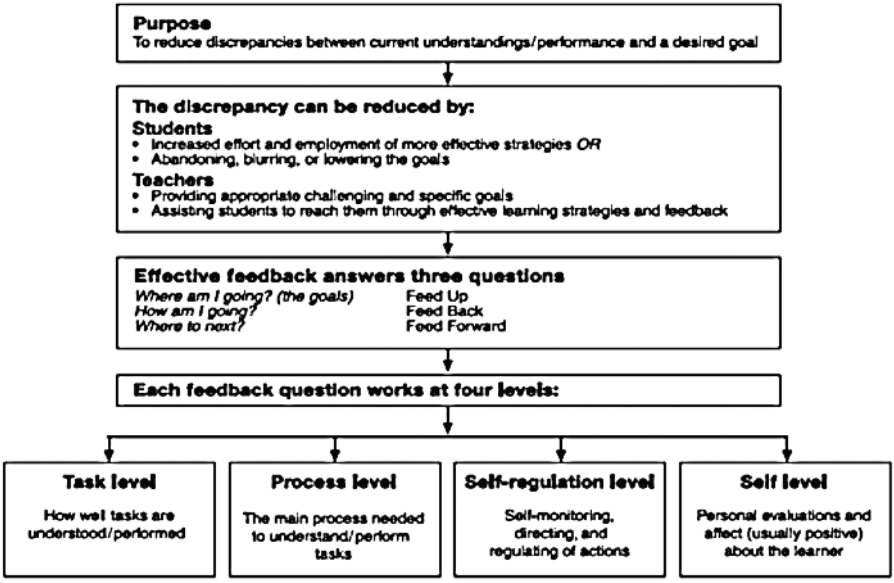

Figure 1. A Feedback model to enhance learning

Hattie and Timperley (2007) identified four major levels of constructive feedback (Figure 1) and stated that the level at which feedback is delivered will have a direct impact on its effectiveness. The four levels of feedback are: Feedback of the task (FT), Feedback of the process (FP), Feedback of self-regulation (FR), and Feedback of self (FS). All of FT, FP, and FR offer constructive support for students that in turn provides them with an opportunity to increase the quality of work (McLaughlin, 1992). Using this system of written, verbal, and peer feedback, or an amalgamation of these, appears to be the best method of delivering feedback.

Feedback which is constructive and meaningful, may result in successful teaching and learning together with to the individual contentment (Altmiller, 2016; Dorić, 2018; Ghazali et al., 2020; Ovando, 1994; Smith, Starratt, McCrink, & Whitford, 2019; Toit, 2012). Constructive feedback is also defined as feedback that is timely, accurate,

constructive, focused on the outcome, supportive, encouraging, and positive (Toit, 2012). Constructive feedback should provide students with a clearly defined end goal (Hattie & Timperley, 2007; Toit, 2012) and must be manageable so it is not overwhelming (Altmiller, 2016; Shute, 2008). It should also focus on what students do correctly as well as letting them know how and what to improve. Parr and Timperley (2010) took this idea further and suggested that to be constructive, feedback must be directed at a deeper level of learning so it triggers cognitive processes.

Providing constructive feedback to students on their performance is crucial to strengthening their learning (Altmiller, 2016; Duffy, 2013; Omer & Abdularhim, 2017), but it is a challenging task (Zehra et al., 2015). Hamid and Mahmood (2010) in their analysis of constructive feedback have drafted the subsequent definition "Where there are agreed standards of behaviour and performance, and two-way communication about what has gone right as well as what has gone wrong, there is feedback that we define as constructive feedback" (p. 224). The characteristics of constructive feedback shown here are that feedback will high spot and reinforce good results, demarcate bad performance, remedial action plans and two parties. (Altmiller, 2016; Hamid & Mahmood, 2010; Omer & Abdularhim, 2017).

Effective Features of Constructive Feedback

During the course of Hattie's various publications and discourses, he established many primary successful feedback elements, emphasizing the significance of the situation, precisely that feedback would fix understanding errors after information was first presented (Hattie & Timperley, 2007). This point differentiates feedback from the first knowledge presentation in the class, as a reaction to the learner's success.

Table 1 provides a list of authors who built their study on Hattie's research (Hattie & Timperley, 2007).

Constructive feedback can be characterized by the following important elements as a structured mechanism to promote positive teaching and learning.

Task-specific

Hattie (2013) defined the learning milieu, especially the specificity of the tasks, "Feedback needs to include information directly relevant to the assignment or learning process that fills [the] void to address this

instructional purpose" (p. 82). In particular, Hatziapostolou and Paraskakis (2010) found the constructive feedback is "directly related to assessment criteria or related to learning outcomes" (p.112). Clark and Mayer (2011) describes Task-specific input ensures that the novice gets important information enabling attention to be centered on a "unique capability deficit,"

Table 1: Features of Constructive Feedback

Features of Feedback	Research	Features of Feedback	Research
Self-regulation	Butler & Winne ,1995; Careless et al., 2011; Embo et al., 2014; Espasa & Menses, 2010; Ferrel, 2012; Furnborough & Truman, 2009; Hattie, 2013; Nicol, 2010; Orsmond & Merry, 2013; Tanner & Jones, 2007.	Praise	Hattie & Timperley, 2007; Burnett and Mandel's, 2010.
FT/ relevant	Clark & Mayer, 2011; Hatziapostolou & Paraskakis, 2010; Hattie & Timperley, 2007; Nicol, 2010; Schlitz et al., 2009; Tanner & Jones, 2007.	Non-threatening Environment / Supportive feedback	Clark & Mayer, 2011; Hattie & Timperley, 2007; Nicol, 2010; Schlitz et al., 2009; Tanner & Jones, 2007.
Timing	Butler & Winne,1995; Erdman & Chan, 2013; Ferrel, 2012; Hattie & Timperley, 2007; Hatziapostolou & Paraskakis, 2010; Hawk & Shah, 2008; Nicol, 2010; Tanner & Jones, 2007; Schlitz et al., 2009.	Self-reliance	Butler & Winne , 1995; Hattie & Temperley, 2007; Gomez et al., 2013; Schlitz et al., 2009; Timmers & Veldkamp, 2011.
Low task complexity	Hattie & Timperley, 2007.	Positive and negative Feedback	Furnborough & Truman, 2009; Nicol, 2010; Hattie & Timperley, 2007.

Feedback with details on how to improve the work is much more effective than simply showing either the work is correct or not (Nyiramana, 2017). Specific (or elaborated) feedback provides information that does not focus on accuracy but gives students an indication of what needs to be fixed or gone through (Shute, 2008). Feedback becomes even more effective when it offers students a challenge, but has a low-level of complexity (Hattie & Timperley, 2007).

The feedback that is not specific can have a deleterious impact on schoolchildren because it leaves them floundering and wondering about how to give the quality of their work (Butler, 1988; Kluger & De Nisi, 1996). A lack of specificity may cause students to view the feedback as useless and result in them becoming frustrated. The flow-on effect of this is that uncertainty can lead to lower levels of learning (Kluger & DeNisi,

1996). Providing specific, clear feedback for procedural and conceptual learning tasks is a general guideline for teachers (Shute, 2008).

Self-Regulation

This whole section is dedicated to Self-regulation, as an important part of this study's structure. According to Hattie (2013), "students are engaged by the expert teachers to make them learn and develop self-regulation in them; enhanced self-efficacy; involvement in mastery learning; and self-esteem as learners" (p. 11). Feedback can be exchangeable if it will focus on skills, and self-regulatory processes" (Nicol, 2010, p. 512).

Feedback on Task

Hattie and Timperley (2007) described "the difficulty of goals and tasks has also affected feedback ... [having] the greatest effect when goals are precise and demanding, but the complexity of tasks is low." (p. 87). This void in the literature indicates researchers' inability to tackle the problem of meeting and recognizing the feedback-effectiveness needs of the target population of students. Assessing the difficulty of the tasks will require a clear understanding of the skills, abilities, previous experience, and task interpretation of the students.

Feedback Timings

Focused teacher comments can enable learning, but the time given to students for revision makes the feedback more powerful (Duffy, 2013). The timing of the delivery of feedback is also important. Shute, (2008) and Din & Saeed, (2018) identified two considerations about the delivery of feedback: whether the feedback is delivered as immediate or delayed feedback. Immediate feedback is instant and delivered directly after the student has responded to a specific task, whereas delayed feedback can be minutes, hours, days, or even weeks after the completion of a task. Earlier corrective information encourages efficient retention (Din & Saeed, 2018); however, there are arguments for and against each method of delivering feedback.

In Shute's 2008 study it was argued that research showed there appeared to be no stable main effect of timing and the delivery of feedback. Effective feedback is designed to accelerate a student's learning, consequently, it cannot be delivered at the end of a unit, nor can it be delivered instantly, but must be provided during the course of the teaching and the learning process to maximize the student's level of achievement (Nicol & Macfarlane-Dick, 2006; Nyiramana, 2017).

Hattie (2014) proposed that stalled feedback slow down the initial rate of learning, however, it expedited a transfer of skills after the feedback had been processed. Receiving work from students at any stage of the writing process, reading it, then writing feedback for students takes time, but the feedback given is personalised and relevant to each student, therefore making it more powerful (Din & Saeed, 2018).

There was also the issue of how much time it took for teachers to provide high quality feedback. Some teachers stated providing feedback to students was labor-intensive (Sadler, 2010); and time was a barrier to giving good feedback (Carless, 2006). Marie (2016) indicated the time constraints associated with providing high-quality feedback cost students, as teachers who were working to provide feedback on student assignments were, therefore, unavailable to attend to other educational practices. Yet, for students to be able to use the high-quality feedback provided by the teacher, students needed to be adequately equipped to understand the feedback by possessing a certain level of expertise often only associated with the teacher (Sadler, 2010). The divide between teacher intent and student perception also need to be addressed, "Clearly, the gap between the teacher's feedback and the student's appreciation of its practical import has to be reduced or closed" (Sadler, 2010, p. 541).

Positive and Negative Feedback

Hattie and Timperley (2007) discussed feedback that, "the influence of feedback tends to be affected by the direction of feedback about output on a task. In particular, feedback is more useful when it offers knowledge about correct answers rather than incorrect ones" (p. 85). Hattie and Timperley (2007) found negative feedback, particularly when consolidated to task-specific input (TS), had the biggest impact in self-direction (FS). FT has reaped both critical and constructive feedback.

Positive feedback would boost proactive feedback users to use "feedback as a learning method by evaluating it and seeking it into the learning process and to enhance the confidence of learners and building a virtuous circle that helps students to achieve learning goals." (Furnborough & Truman, 2009, p. 412).

Feedback as Praise

Hattie and Timperley (2007) found in his study, "students like praises, not for ability and behavior but specifically for effort and achievement. Most of them favored private praise, as some students viewed it as a punishment if the admiration took place before a peer group that devalued education" (p. 98).

Remarkably, "older students perceived praise after success or neutral feedback after failure as an indication that the teacher perceived their ability to be low" (Hattie and Timperley, 2007, p. 97).

Feedback, in the form of praise, was also investigated in Burnett and Mandel's (2010) study of feedback in grades 1 through 7, researchers observed several classrooms and found teachers used general praise feedback 71% to 93% of the time and less than 10% on effort and ability (p. 149). The data indicated that 89% of the feedback was positive and 11% of the feedback was negative (p.149). "Key finding of this research was that the primary form of input used by teachers, 77 percent of the time or on average 35 times per hour, was general, non-targeted praise" (p.151). Praise, while often intended to motivate students or to mitigate critical teacher comments rarely provided useful information the student could use to reach the learning goal of the lesson; instead, the praise often diluted the useful feedback message, and in some cases, praise produced levels of learned helplessness in the student psyche (Hattie, 2012). Feedback about the self, typically in the form of praise, was personal and was rarely effective in enhancing learning. Different types of praise could often set students along a trajectory of beliefs about their own ability to learn, as well as their level of intelligence.

Effects of Constructive Feedback on Students' Learning: A Theoretical Background

The role of feedback in learning has been investigated with massive widely held of studies focused on measuring the effects of feedback. This seems rational given that early, behavioral models viewed feedback as a uni-directional transfer of knowledge from the adept to the beginner to allow learning to progress or extinct (Brooks et al., 2019). Take for granted, Thorndike's (1933) law of effect, Which are the behavioral consequences (Schunk, 2012), was crucial in the establishing understanding that feedback was a stimulus or message that could lead to learners modifying their initial response. Similarly, Skinner (1963), using optimistic and adverse feedback messages as a motivation to change actions to produce desired results, built on this idea. This use of feedback via punishment or reward as an extrinsic motivator has negative effects on learning (Brooks et al., 2019). According to Thurlings, Vermeulen, Bastiaens, & Stijnen (2013), "Behaviourism focuses on students' observable behaviour, which can be influenced by stimuli like praise and punishment. In small steps, teachers guide students through the curriculum. Behavioral feedback systems are simple and linear: feedback is given, and an outcome occurs as a result" (p. 4, Fig 2).

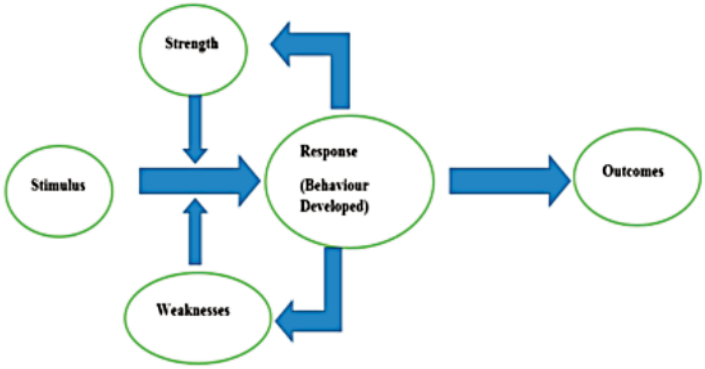

Figure 2. Behaviourism Perspective

Following behaviourism perspective, it is clear that motivation is an important element that influences students learning in general and evaluation in particular, either positively or negatively. One of the most distinguished up-to-date theories of psychological motivation is what Ames (1992) calls "*goal orientation theory*". This theory argues that two separate forms of learning objectives exist: mastery and success. The former are targeted at making schoolchildren "developing new skills, trying to understand their task, enhancing their ability level, or gaining a sense of mastery-based on self-referenced expectations" (p. 262). On the other hand, success targets guide schoolchildren to receive either higher grades or public credit for what they accomplished. Ames determines that mastery objectives are more important than performance because they stimulate schoolchildren "creativity and make them more motivated" (Zahroh, Mujiyanto, & Saleh, 2020).

Interest and understanding of school interest are two factors used to assess the motivation of the students (Eccles & Wigfield, 2002). Following the expectation-value theory of Eccles, impetus differs with the significance given to the goal we want to meet and with our expectations of achievement. In addition, Wolters and Rosenthal (2000) claimed when schoolchildren are persuaded that they have an essential, informative learning strategy, those who are more inclined to make a conscious effort to complete the task and continue for longer. Learners must take into account schoolwork as beneficial for the accomplishment of career ambitions; alternatively their motivation to involve in a self-regulated learning the procedure will most likely diminish.

Atkinson (1957) said that the perception-value principle of encouragement for accomplishment developed. The main premise of this and other expectation-value theories is that behavior hinges on the expectation of achieving a unique result (e.g., target, legitimize) as a result

of conducting specified behaviors and how much one values resulting from them. People judge the likelihood of achieving different results. They're not inspired to pursue the impossible, because they're not chasing outcomes that are viewed as unattainable. Even the expectation of a positive outcome does not produce action unless the outcome is valued. An attractive result, coupled with the conviction it is achievable, motivates people to act.

The cognitive constructivist self-regulation theoretical account viewed this as containing three sub-processes: self-observation, self-judgment, and self-reaction. School children participates in learning programs with specific objectives such as gaining information and skills and finalizing assignments. Pertaining to goal targets in mind, they observe, judge, and respond to their perceived progress towards their target. This traditional perspective was strengthened to highlight the unpredictable nature of self-regulation and included activities that involve pre- and post-task collaboration. This cyclical process reflects the social cognitive focus on reciprocal interactions among individual, behavioral, and regulatory / social factors. The preconceived step supersedes sample report and relates to procedures that pave the way for action, such as setting goals, determining a strategy, and evaluating learning self-efficacy. The performance management step includes processes that occur during learning and affect attention and practice, such as techniques being applied and progress monitoring. During the self-reflection a phase that takes place during breaks and after completion of the task, the learners respond to their efforts by setting new goals, adjusting their strategies, and assigning results.

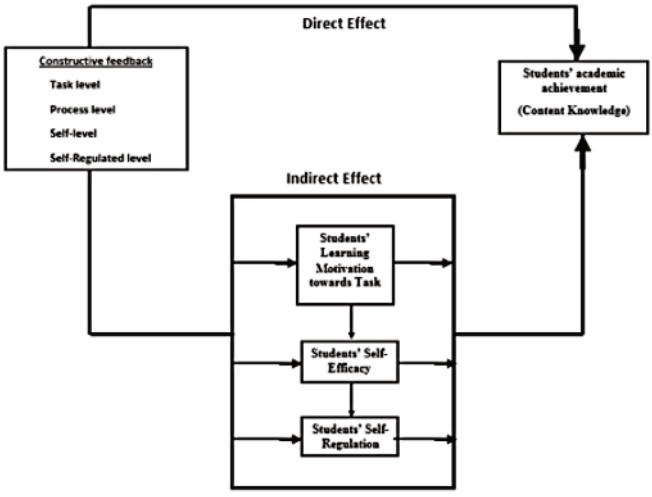

Figure 3. Research Framework

Present-day Constructivist approach and self-regulatory feedback approaches consider the learner an efficient informant in getting, describing, and implementing feedback (Thurlings et al., 2013). Thus, a conceptual framework of constructive feedback (Figure 3) guides the theoretical framework for this study. In the perspective of this study, we can relate the theory-oriented goals to the types of evaluation: achievement goals for summative and mastery goals for formative purposes. The explanation for this is that mastery goals (focusing on understanding the content) are the key distinguishing characteristic of formative assessments while success goals (focusing only on demonstrating skill and having good grades) are closely related to summative purposes. This, in effect, will give us an impression that formative evaluation is superior to summative, because it allows students become more interested in the learning process. However, if formative evaluation and formative feedback are considered successful tools in the learning of students, it is necessary to understand that formative evaluation does not depend solely on learning tasks and the subsequent feedback but "on the broader context about the motivation and the self-perceptions of students" (Black,1999: 125) And the theory of expectation-value emphasizes the critical part of academic assignment-value convictions in designing pupil learners' interest (Pintrich, 2003). In their interpretation of the "modern theory of expectation-value", Eccles and Wigfield (2002) stressed the "central function of task-value for the students' expectations of success, choices related to achievement, and results". Theoretically, Wolters and Rosenthal (2000) Say that individuals who are assured that learning activities are likely to be meaningful, remarkable and usable spend more effort and persist longer to complete an activity. In addition, even when students lack self-efficacy, if they value the learning activity, their contributions are likely to begin and carry on (Zimmerman, 2002). According to Thurlings et al. (2013), "Meta cognitivism stresses that learners learn to learn. In this theory of learning, self-regulated learning fits in. In their (self-regulated) learning processes, such as preparation and tracking, teachers direct students, and the learners are responsible for their own learning. This means that at a starting point, the feedback process begins with learners. Teachers then provide input and the students flow on to another level. A loop brings learners back to another starting point as the method is continuous" (p.4). He further explained that, "The focus of social constructivism is on how learners are actively involved in building their knowledge. The starting point for learning is prior knowledge. Learning happens by evaluating different

instances and by de-contextualizing the heuristics. This process is guided by teachers. In the learning processes, peers are involved and students collaborate. This indicates that at a starting point, the feedback process starts with learners. Multiple peers and educators provide input. Then, since the learning is continuing, students transfer to another stage, which becomes a new starting stage." (p. 4).

METHODOLOGY

A systematic content analysis technique was used to retrieve articles. Schimmel (1983) mention the criteria for systemic content analysis that is; (1) selection of appropriate computerized database (2) identification of appropriate keywords (3) review of abstracts and (4) comprehensive review of selected articles. Current article adapts the same process. First, well-known publishers like Emerald, Elsevier, Springer, Taylor & Francis, and Sage publications have been searched with related keywords (e.g., constructive feedback, academic achievement, feedback and self-regulation; feedback and self-efficacy; feedback and motivation). Second, all ISI journals names with feedback and its effects were also examined. The search covered 221 articles/ books from January 2000 up to May 2020 including some older publications as well, by means of snowballing. Out of these, 92 articles were filtered and incorporated in this study. The criterion of selection was "Search for papers published in peer-reviewed scientific journals in English, Search for papers published in the last 15 years, selected articles contain at least one keyword in their title or abstract, excluding papers related to very narrow aspects or contexts, reading all remaining abstracts and reading all remaining articles in their entirety". After the selection of most relevant articles, a detail and comprehensive bibliographic analysis have been done.

CONCLUSION

Receiving constructive feedback is linked to improved levels of achievement, motivation, and self-efficacy. It requires students to be active learners in their education, and can help lower ability students achieve more (Bandura, 2001; Butler & Winne, 1995; Kluger & DeNisi, 1996; Schunk, 2012; Vollmeyer &Rheinberg, 2005; Zimmerman & Bandura, 1994). Constructive feedback can also assist in the development of the skills required for students to become self-regulating. However, for students to be able to make the most of any tools designed to improve their learning experience, they must be willing and engaged participants in their own learning.

Motivation and Self-regulation are related and Feedback is an important stimulus for self-regulation. Self-regulations are affected by motivational factors such as goals setting, expectations of outcomes, and self-efficacy, are important motivational variables that affect self-regulation. Taking part in effective self-regulated learning will in effect inspire learners to fix new targets and continue to learn. Certain motivating factors involved in self-regulation include beliefs, goals and assist in the search for i.e. constructive feedback from the teacher. These variables collectively will aid to decide that getting behavior is set off and maintained as pupils make adoptions about the relaxed, place, timing, and outcomes of their learning.

The current study has developed a theoretical framework for the successful implementation of constructive feedback model. After a detailed literature review, it has been revealed that there is very limited theory-based empirical research available. Second, although literature is available in language subject (English) but there is no study available which emphasis about the effects of feedback in science subject. Third, literature covered only one aspect at a time but this study covered all dimensions. This study has developed a theoretical framework on literature base data. Now there is a need to further empirically verifying this framework. This study will imply all level of constructive feedback, and its effects will be observed on students.

REFERENCES

Ahmed, U., Akhtar, R. N., & Aslam, R. (2020). Formative assessment in elementary English classroom: a case study of semi-government organization of Pakistan. *Academic Research International, 11*(2), 1-9.

Altmiller, G. (2016). Strategies for providing constructive feedback to students. *Nurse Educator*, *41*(3), 118-119.

Ames, C. (1992). Achievement goals and the classroom motivational climate. *Student perceptions in the classroom*, *1*, 327-348.

Anderson, L., & Block, I. H. (1975). *Mastery learning in classroom instruction*. New York: Macmillan.

Andrade, H. L., Wang, X., Du, Y., & Akawi, R. L. (2009). Rubric-referenced self-assessment and self-efficacy for writing. *The Journal of Educational Research*, *102*(4), 287-302.

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review*, *64*(6p1), 359.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1-26. doi: 10.1146/annurev.psych.52.1.1

Black, P. (1999). Assessment, learning theories and testing systems. *Learners, Learning and Assessment*, 118-134.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, *5*(1), 7-74.

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2003). *Assessment for learning: Putting it into Practice*. Maidenhead, UK: Open University Press.

Brookhart, S. M. (1997). A theoretical framework for the role of classroom assessment in motivating student effort and achievement. *Applied Measurement in Education*, *10*(2), 161-180.

Brookhart, S. M. (2017). *How to give effective feedback to your students*. ASCD.

Brooks, C., Carroll, A., Gillies, R. M., & Hattie, J. (2019). A matrix of feedback for learning. *Australian Journal of Teacher Education*, *44*(4), 2. http://dx.doi.org/10.14221/ajte.2018v44n4.2

Burnett, P. C., & Mandel, V. (2010). Praise and Feedback in the Primary Classroom: Teachers' and Students' Perspectives. *Australian Journal of Educational & Developmental Psychology*, *10*, 145-154.

Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research, 65*(3), 245-81.

Carless, D., Salter, D., Yang, M., & Lam, J. (2011). Developing sustainable feedback practices. *Studies in Higher Education, 36*(4), 395-407. doi: 10.1080/ 03075071003642449

Cauley, K. M., & McMillan, J. H. (2010). Formative assessment techniques to support student motivation and achievement. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *83*(1), 1-6.

Clark, R. C., & Mayer, R. E. (2011). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (3rd ed.). San Francisco, CA: Pfeiffer.

Clarke, S. (2003). *Enriching feedback in the primary classroom: Oral and written feedback from teachers and children*. London: Hodder and Stoughton.

Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools*, *41*(5), 537-550.

Dean, B. L. (2005). Citizenship education in Pakistani schools: Problems and possibilities. *International Journal of citizenship and Teacher education*, *1*(2), 35.

Din, K. U., & Saeed, M. (2018). Relationship between University Students' English Proficiency, Academic Achievement and their Satisfaction on Teacher Feedback. *Bulletin of Education and Research*, *40*(3), 129-143.

Dixson, D. D., & Worrell, F. C. (2016). Formative and summative assessment in the classroom. *Theory into practice*, *55*(2), 153-159.

Dorić, L. (2018). *The Role of Corrective Feedback in Oral Production* (Doctoral dissertation, Univerza v Mariboru, Filozofska fakulteta).

Duffy, K. (2013). Providing constructive feedback to students during mentoring. *Nursing Standard (through 2013)*, *27*(31), 50.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, *53*(1), 109-132.

Embo, M., Driessen, E., Valcke, M., & van der Vleuten,V. C. P. M. (2014). A framework to facilitate self-directed learning, assessment and supervision in midwifery practice: A qualitative study of supervisors' perceptions. *Nurse Education in Practice, 14*(4), 441-446. doi:10.1016/j.nepr.2014.01.015

Erdman, M. R., & Chan, J. K. (2013). Providing corrective feedback during retrieval practice does not increase retrieval-induced forgetting. *Journal of Cognitive Psychology*, *25*(6), 692-703. doi:10.1080/20445911.2013.790389

Espasa, A., & Meneses, J. (2010). Analysing feedback processes in an online teaching and learning environment: An exploratory study. *Higher Education, 59*(3), 277- 292. doi: 10.1007/s10734-009-9247-4

Ferrel, G. (2012). *A view of the assessment and feedback landscape: Baseline analysis of policy and practice from the JISC assessment & feedback programme*.

Furnborough, C., & Truman, M. (2009). Adult beginner distance language learner perceptions and use of assignment feedback. *Distance Education, 30*(3), 399-418. doi: 10.1080/01587910903236544

Ghazali, N. H. C. M., Abdullah, N., Zaini, S. H., & Hamzah, M. (2020). Student Teachers' Conception of Feedback Within An Assessment For Learning Environment: Link to Pupil Aspiration. *Jurnal Cakrawala Pendidikan*, *39*(1), 54-64.

Gomez, S., Andersson, H., Park, J., Maw, S., Crook, A., & Orsmond, P.

(2013). A digital ecosystems model of assessment feedback on student learning. *Higher Education Studies, 3*(2), 41-51. http://dx.doi.org/10.5539/hes.v3n2p41

Gulzar, K., & Mahmood, N. (2019). Challenges to Maintaining Alignment between Secondary Level Mathematics Curriculum and Assessments in Pakistan. *Journal of Research*, *13*(2), 234-246.

Guskey, T. R. (2019). Grades versus comments: Research on student feedback. *Phi Delta Kappan*, *101*(3), 42-47.

Hamid, Y., & Mahmood, S. (2010). Understanding constructive feedback: a commitment between teachers and students for academic and professional development. *J Pak Med Assoc*, *60*(3), 224-7.

Harks, B., Rakoczy, K., Hattie, J., Besser, M., & Klieme, E. (2014). The effects of feedback on achievement, interest and self-evaluation: the role of feedback's perceived usefulness. *Educational Psychology*, *34*(3), 269-290.

Hattie, J. & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. doi:10.3102/003465430298487

Hattie, J. (1992). *What works in Special Education*. Presentation to the Special Education Conference. Retrieved from http://www.education.auckland.ac.nz/webdav/site/education/shared/hattie/docs/special-education.pdf

Hattie, J. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. Abingdon, England: Routledge.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. New York, NY: Routledge.

Hattie, J. (2013). Calibration and confidence: Where to next?. *Learning and Instruction*, *24*(Calibrating Calibration: Creating Conceptual Clarity to Guide Measurement and Calculation), 62-66. doi:10.1016/j.learninstruc.2012.05.009

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112.

Hatziapostolou, T., & Paraskakis, I. (2010). Enhancing the impact of

formative feedback on student learning through an online feedback system. *Electronic Journal of ELearning, 8*(2), 111-122. Retrieved from http://files.eric.ed.gov /fulltext/EJ895699.pdf

Hawk, T. F., & Shah, A. J. (2008). A revised feedback model for task and self-regulated learning. *The Coastal Business Journal, 7*(1), 66-81.

International Crisis Group. (2014). *Educational reforms in Pakistan*: [Asia Report No. 257]. Islamabad: "Author".

Javed, T. (2017). *Effect of Classroom Environment, Motivation and Teacher Feedback on Academic Achievement of Secondary School Students in Pakistan* (Doctoral dissertation, Mohi-ud-Din Islamic University) Nerian Sharif, AJ&K.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, *119*(2), 254.

Maj-Stepien, M. (2016). *Effects of Feedback, in Combination with Emotional Intelligence and Achievement Motivation, on Generation of Creative Ideas* (Doctoral dissertation, Roosevelt University), USA.

Mao, J., & Peck, K. (2013). Assessment strategies, self-regulated learning skills, and perceptions of assessment in online learning. *Quarterly Review of Distance Education, 14*(2), 75-95 & 121.

McLaughlin, T. F. (1992). Effects of written feedback in reading on behaviorally disordered students. *The Journal of Educational Research, 85*(5), 312-316.

McMillan, J.H. 2004. *Classroom assessment: Principles and practice for effective instruction* 3rd ed. Boston: Pearson.

National Professional Standards for Teachers in Pakistan. (2009). Policy and Planning Wing Ministry of Education, Government of Pakistan Islamabad.

Nicol, D. (2010,). From monologue to dialogue: Improving written feedback processes in mass higher education. *Assessment & Evaluation in Higher Education*, *35*(5), 501-517. doi: 10.1080/02602931003786559

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self□regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, *31*(2), 199-218.

Nyiramana, C. (2017). Constructive feedback to students: a tool to enhance educational quality. *ZEP: Zeitschrift für internationale Bildungsforschung und Entwicklungspädagogik*, *40*(2), 14-17.

Omer, A. A. A., & Abdularhim, M. E. (2017). The criteria of constructive feedback: the feedback that counts. *Journal of Health Specialties*, *5*(1), 45.

Orsmond, P., & Merry, S. (2011). Feedback alignment: Effective and ineffective links between tutors' and students' understanding of coursework feedback. *Assessment & Evaluation in Higher Education, 36*(2), 125-136. doi: 10.1080 /02602930903201651

Ovando, M. N. (1994). Constructive Feedback. *International Journal of Educational Management*, *8*(6), 19-22. http://dx.doi.org/10.1108/09513549410069185

Pajares, F. (2003). Self-efficacy beliefs, motivation, and achievement in writing: A review of the literature. *Reading &Writing Quarterly*, *19*(2), 139-158.

Panadero, E., & Romero, M. (2014). To rubric or not to rubric? The effects of self-assessment on self-regulation, performance and self-efficacy. *Assessment in Education: Principles, Policy & Practice*, *21*(2), 133-148.

Parr, J. M., & Timperley, H. S. (2010). Feedback to writing, assessment for teaching and learning and student progress. *Assessing writing, 15*(2), 68-85.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, *95*(4), 667.

Ramaprasad, A. (1983). On the definition of feedback. *Behavioral Science, 28*(1), 4-13.

Reddy, K. K. (2019). *Improving Students' Assessment and Evaluation Experience in Higher Education: A Formative Peer Review Perspective* (Doctoral dissertation, University of Otago), New Zealand.

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science*, *18*(2), 119-144.

Sadler, D. R. (1998). Formative assessment: Revisiting the territory. *Assessment in education: Principles, Policy & Practice*, *5*(1), 77-84.

Sadler, D. R. (2010). Beyond feedback: developing student capability in complex appraisal. *Assessment & Evaluation in Higher Education, 35*(5), 535-550.

Schimmel, B. J. (1983). A Meta-Analysis of Feedback to Learners in Computerized and Programmed Instruction.

Schlitz, S. A., O'Connor, M., Pang, Y., Stryker, D., Markell, S., Krupp, E., Byers, C., Jones, S. D., & Redfern, A. K. (2009). Developing a culture of assessment through a faculty learning community: A case study. *International Journal of Teaching and Learning in Higher Education, 21*(1), 133-147.

Schunk, D. H. (2012). *Learning theories an educational perspective sixth edition*. Pearson.

Seigel, D. (2010). *Mindsight: The new science of personal transformation*. New York, NY: Bantam/Random House.

Shute, V. J. (2008). Focus on formative feedback. *Review of educational research*, *78*(1), 153-189.

Skinner, B. F. (1963). Operant behavior. *American Psychologist*, *18*(8), 503.

Skipper, Y., & Leman, P. J. (2017). The role of feedback in young people's academic choices. *International Journal of Science Education*, *39*(4), 453-467.

Smith, E. C., Starratt, G. K., McCrink, C. L., & Whitford, H. (2019). Teacher Evaluation Feedback and Instructional Practice Self-Efficacy in Secondary School Teachers. *Educational Administration Quarterly*, 0013161X19888568.

Stronge, J. H. (2002). Qualities of Effecetive Teachers. Alexandria, VA, USA: Association for Supervision & Curriculum Development.

Tahir, T., Khurshed, T., Ishfaq, U., & Gul, M. (2015). Effective Motivation Techniques Used By Teachers In Academic Achievements At

Secondary School Level. *The Shield-Research Journal of Physical Education & Sports Science*, *10*(1).

Tanner, H., & Jones, S. (2007). Using video-stimulated reflective dialogue to learn from children about their learning with and without ICT. *Technology, Pedagogy & Education, 16*(3), 321-335. doi:10.1080/14759390701614454.

Thompson, A. M., Wiedermann, W., Herman, K. C., & Reinke, W. M. (2020). Effect of Daily Teacher Feedback on Subsequent Motivation and Mental Health Outcomes in Fifth Grade Students: a Person-Centered Analysis. *Prevention Science*, 1-11.

Thorndike, E. L. (1933). A proof of the law of effect. *Science*, *77*(1989), 173-175.

Thurlings, M., Vermeulen, M., Bastiaens, T., & Stijnen, S. (2013). Understanding feedback: A learning theory perspective. *Educational Research Review*, *9*, 1-15. doi.org/10.1016/j.edurev.2012.11.004.

Timmers, C., & Veldkamp, B. (2011, April 1). Attention paid to feedback provided by a computer-based assessment for learning on information literacy. *Computers & Education, 56*(3), 923-930. doi:10.1016/j.compedu.2010.11.007

Toit, E. D. (2012). Constructive feedback as a learning tool to enhance students' self-regulation and performance in higher education. *Perspectives in Education*, *30*(2), 32-40.

Vollmeyer, R., & Rheinberg, F. (2005). A surprising effect of feedback on learning. *Learning and Instruction*, *15*(6), 589-602.

William, D., & Black, P. (1996). Meanings and consequences: a basis for distinguishing formative and summative functions of assessment?. *British Educational Research Journal*, *22*(5), 537-548.

Wolters, C. A., & Rosenthal, H. (2000). The relation between students' motivational beliefs and their use of motivational regulation strategies. *International Journal of Educational Research*, *33*(7-8), 801-820.

Zahroh, R., Mujiyanto, J., & Saleh, M. (2020). Students' Attitudes toward Teachers' Written Corrective Feedback and Their Writing

Skill. *English Education Journal*, 9-17.

Zehra, T., Tariq, M., Motiwala, A., Ali, S. K., & Boulet, J. (2015). Challenges of providing timely feedback to residents: Faculty perspectives. *Journal of Pakistan Medical Association*, *65*(10), 1069.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into practice*, *41*(2), 64-70. https://doi.org/10.1207/s15430421tip4102_2

Zimmerman, B. J., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal*, *31*(4), 845-862.

Zumbrunn, S., Marrs, S., & Mewborn, C. (2016). Toward a better understanding of student perceptions of writing feedback: a mixed methods study. *Reading and Writing*, *29*(2), 349-370. DOI 10.1007/s11145-015-9599-3.