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2022년 2월
박사학위 논문

Development and Validation of an ‘Effective Feedback’ Instrument for Higher Education

조선대학교 대학원
교 육 학 과
김 규 은

조선대학교
CHOSUN UNIVERSITY

Development and Validation of an ‘Effective Feedback’ Instrument for Higher Education

대학수업을 위한 ‘효과적인 피드백’ 측정도구 개발 및 타당화

2022년 2월 25일

조선대학교 대학원

교 육 학 과

김 규 은

조선대학교
CHOSUN UNIVERSITY

Development and Validation of an ‘Effective Feedback’ Instrument for Higher Education

지도교수 김 민 성

이 논문을 교육학 박사학위신청 논문으로 제출함

2021년 10월

조선대학교 대학원

교 육 학 과

김 규 은

조선대학교
CHOSUN UNIVERSITY

김규은의 박사학위논문을 인준함

위원장 조선대학교 교 수 이 지 은 (인)

위 원 조선대학교 교 수 배 영 주 (인)

위 원 조선대학교 교 수 최 효 선 (인)

위 원 조선대학교 교 수 김 민 성 (인)

위 원 목포해양대학교 교 수 장 선 영 (인)

2022년 1월

조선대학교 대학원

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국 문 초 록

대학수업을 위한 ‘효과적인 피드백’ 측정도구 개발 및 타당화

김 규 은
지도교수 : 김 민 성
조선대학교 대학원
교 육 심 리 학 과

본 연구는 대학수업을 위한 '효과적인 피드백' 측정도구를 개발하고 타당화하는 데 목적이 있다. 이를 위해 먼저 효과적인 피드백에 대한 선행연구를 검토하고 대학생 230명에게 ‘효과적인 피드백’에 대한 경험을 묻는 개방형 설문 응답을 분석하여 '효과적인 피드백 특성'과 '피드백 성과'의 구성요인을 탐색하였다.

다음으로 이상의 구성 요인의 내용을 대표하는 문항을 개발하였고, 2회에 걸친 전문가 패널의 내용타당도 검토를 통해 '효과적인 피드백 특성' 5개와 '피드백 성과' 6개의 구성요인이 수정 및 보완되었으며, 이에 기반한 68개의 예비문항이 개발 및 수정되었다. '효과적인 피드백 특성'은 구체적 피드백(detailed feedback), 방향제시 피드백(guiding feedback), 격려 피드백(acknowledging feedback), 상호작용 피드백(interactive feedback), 그리고 적시적 피드백(timely feedback)의 요인으로 이루어졌으며, '피드백 성과'는 이해(understanding), 학습방법(learning method), 자기성찰(self-reflection), 노력(effort), 도움요청(help-seeking), 자율적 동기(autonomous motivation) 등의 요인으로 구성되었다.

최종 검사의 문항을 선정하기 위한 예비검사는 278명의 대학생들을 대상으로 실시되었으며, 탐색적 요인분석과 신뢰도 분석을 통해 '효과적인 피드백 특성' 도구에 대해서는 5요인(구체적 피드백, 방향제시 피드백, 격려 피드백, 상호작용 피드백, 적시적 피드백) 20문항, '피드백 성과' 도구에 대해서는 4요인(이해, 자기성찰, 도움요청, 자율적 동기) 16문항이 최종적으로 채택되었다.

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최종 검사의 타당화를 위해 최종 선택된 검사 문항들을 524명의 대학생들에게 실시하였고, 구인타당도 점검을 위해 확인적 요인분석을 실시한 결과, 본 연구에서 제안한 효과적인 피드백의 구성요인과 측정문항의 구조모형이 적합한 것으로 나타났다. 최종 측정도구의 신뢰도를 확인하기 위해 내적합치도 신뢰도(Cronbach's α) 분석을 실시한 결과, '효과적인 피드백 특성'의 하위 도구는 .89~.94(전체 신뢰도: .96), '피드백 성과'의 하위 도구는 .91~.93(전체 신뢰도: .92)로 나타나 하위 도구 및 전체 신뢰도는 양호한 것으로 확인되었다.

다음으로 피드백 관련 선행연구에서 확인된 변인들 간의 관계가 본 연구에서도 확인되는지를 통해 수렴타당도 및 변별타당도를 검증하였다. 먼저, '효과적 피드백' 측정도구의 모든 구성요인은 학업적 자기효능감, 목표지향성(숙달목표, 수행목표), 그리고 교수자-학생 관계와 높은 상관을 보였다. 특히 교수자-학생 관계 척도의 모든 구성요인과 높은 정적 상관을 보였는데, 이는 교수자에 대한 학생의 신뢰나 교수자의 관심이 학습자로 하여금 피드백을 수용하고 활용하는 데 영향을 준 것으로 해석할 수 있다.

학문분야별로 효과적인 피드백에 대한 학생의 인식에 차이가 있는지를 살펴본 결과, 학문분야 간에 유의미한 차이가 있는 것으로 드러났다. 인문/사회와 예체능 계열에 비해 자연/이공 계열의 학생들이 전반적으로 효과적인 피드백의 구성 요소에 대해 자신이 수강한 강좌에서의 효과적인 피드백 특성과 성과를 낮게 평정하였다.

마지막으로 이미 타당화된 검사와 본 연구의 검사와의 공인타당도를 검토한 결과, 본 측정도구는 형성적 피드백 척도와 피드백 리터러시 척도와의 유의미한 정적 상관을 나타내어 대학수업을 위한 '효과적인 피드백' 측정도구의 공인타당도를 확보할 수 있었다.

교수자의 피드백은 학습자의 학업에 대한 중요한 정보를 제공하므로 효과적인 학습을 위한 중요한 요소이다. '효과적인 피드백' 측정도구는 교수자가 학습자에게 피드백을 어떻게 전달하고 피드백이 학습자에게 인지적, 행동적, 그리고 정의적 측면에서 어떠한 영향을 미치는지에 대하여 이해하는 데에 도움을 줄 것으로 기대되며 대학수업에서의 피드백의 질 향상을 위해 의미있게 활용될 수 있을 것이다.

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1. Introduction

Giving and receiving feedback is part of every human relationship. During conversations, our response to person's statement or question may influence their behavior, motivation, and future decisions. Hattie and Timperley (2007) defined feedback as "information provided by an agent (teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding (p. 81)." In the educational context in particular, feedback is widely considered as a powerful tool for student learning (Bandura, 1991; Black & William, 1998; Hattie & Timperley, 2007). Feedback for students is crucial as it stimulates a change in aspects of their understanding by guiding them to reflect on the learning process (Dainton, 2018). Students, therefore, become aware of their misconceptions and errors, and get the opportunity to make adjustments for a better outcome. Several studies (e.g., Hattie, Masters, & Birch, 2015; Klieme, Leutner, & Kenk, 2010) have revealed that feedback increases cognitive process, intrinsic motivation, and the willingness to put effort into a task. Therefore, scholars have attempted to find ways to provide effective feedback for teaching. However, giving effective feedback to students still seems to be major concern in education (Henderson, Ryan, & Phillips, 2019).

In early literature, studies such as that of Kluger and DeNisi (1996) focused on potential types of effective feedback for student learning, which has been explored along the dimensions of source, format, timing, media, and content (Balcazar, Hopkins, & Suarez, 1985; Golke, Dörfler, & Artelt, 2015; Lee & Sohn, 2018). Among these dimensions, timing and content were assumed as important types of feedback (Goodman & Wood, 2004; Kulhavy & Wager, 1993). The content of feedback includes attributes as to whether it is correct or not, specific, or positive (Scheeler, Ruhl, & McAfee, 2004). For instance, feedback content is broadly distinguished between verification and elaborated feedback (Kulhavy & Stock, 1989). Verification feedback is determined as simple information stating whether an answer is correct or incorrect (Shute, 2008), whereas elaborated feedback is defined as any additional information explaining the reasons for the correct/incorrect response or guidance toward the correct answer

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(Murphy, 2007). Feedback function relates to whether the feedback is of a facilitative or directive nature (Sortkaer, 2019). Directive feedback states what is to be revised or corrected, whereas facilitative feedback involves provision of hints and suggestions to facilitate students' own revision (Acher, 2010). Additionally, feedback valence is an important determinant of the emotional experiences of students, that, in turn, influence their acceptance of feedback (Audia & Locke, 2003). Former studies have shown that positive feedback positively influences student motivation and behavioral persistence (Mabbe et al., 2018), whereas negative feedback, such as criticism, may discourage individuals (Koka & Hein, 2005; Mouratidis et al., 2008).

In aspects of timing, applied studies of actual classroom settings found immediate feedback more effective than delayed feedback (Bangert-Drowns et al., 1991; Kulik & Kulik, 1988) even though delayed feedback gained better results in laboratory studies.

Prior studies explored a wide range of effective feedback characteristics that facilitated student learning. Types of feedback with specific content, complexity levels, and timing have shown positive effects in some studies, and negative effects in others (Kluger & DeNisi, 1996; Mory, 2004; Thurlings et al., 2013). It should be noted that feedback studies have mostly measured feedback outcome by comparing the before with the after (Finn et al., 2018; Kulhavy & Stock, 1989; Van der Kleij et al., 2015), which may have led to varied results between the studies. Furthermore, great number of studies have shown that the feedback outcome is dependent upon test results (i.e., whether it is correct or not) and/or summative assessments (e.g., Bohnacker-Bruce, 2013; Metcalfe, Kornell, & Finn, 2009). Lastly, the limitation of the aforementioned studies is that they focused on only one of the feedback domains that is, either the cognitive, motivational, or behavioral context. This study, therefore, highlights that if students perceive feedback as effective, it leads to beneficial outcomes across student cognition, behavior, and motivations.

An increasing number of studies are paying attention to what students do with feedback (Jönsson, 2013; Winstone, Nash, Parker, & Rowntree, 2017). One of the preferences of students regarding feedback was that the information had to be useful for future learning improvement and not just an elaboration thereof (Drew, 2001; Ferguson, 2011; Lipnevich & Smith, 2009). Furthermore, the meaning "effective" feedback varies

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in the literature, owing to differences in perceptions thereof between instructors and students (Carless, 2006). Instructors may perceive certain feedback strategies as being useful and effective, but, as Ramprasad (1983) stated, feedback only fulfills its function if it attempts to close the gap between the actual level of knowledge and the reference level. Thus, there is a need for students to also respond to the feedback. Studies show that the effort of improving the feedback delivery does not necessarily lead to improvement in learning (Jönsson, 2013; Nicol, 2010). Winstone et al. (2017) stated that a critical factor for effective feedback is how students engage with the feedback they receive. Therefore, understanding how students perceive instructor feedback is becoming central in feedback research.

The shift of learning theories and paradigms is among the influencing in determinants of the characteristics of effective feedback. Thurlings et al. (2013) claimed that there are differences between the learning theories, with some feedback considered as effective and some not. The main distinction between these theories is that the constructive perspective views learners as active agents in constructing knowledge (Jonassen & Land, 2012) as opposed to behavioral and cognitive perspectives, with more recent studies accepting this perspective by implying that feedback is not just a simple transfer of knowledge (Esterhazy, 2018). Similarly, Nicole and Macfarlane-Dick (2006) suggested moving away from the view that instructors control the feedback outcome, and accepting the standpoint that students need to be actively involved in the process. Thus, it is necessary to understand why students either engage or disengage with instructor's feedback in the first place.

Narciss (2004) proposed that the outcome of feedback might depend on multiple factors such as the quality of feedback, and students' commitment and involvement in the task (Hattie & Timperley, 2007). Instructor feedback potentially generates an emotional reaction in students, if students perceive the feedback as a criticism, which may cause them to feel personally offended and, ultimately decrease their commitment to the task. Feedback is especially likely to be ineffective when the student perceives the feedback as intimidating (Watling, Driessen, van der Vleuten, Vanstone, & Lingard,, 2013). Without understanding the motivational and affective dimensions, instructors will not be able to explain why some students use the feedback while others do not. In

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contrast, there are significant contributors to students' acceptance of feedback, namely, the perceived usefulness of feedback to become involved with feedback (Brett & Atwater, 2001; Vroom, 1964).

Sadler (2010) noted that students have little consideration for instructors' invested time and effort in creating and delivering feedback. The study of Glover and Brown (2006) indicated, although undergraduate students found feedback valuable, they did not use it enough to improve their work. As a result, instructors perceived their efforts as unrecognized, leading to a mismatch between staff and students' perceptions of effective feedback (Carless, 2006; Deeley, Fishbacher-Smith, Karadzhov, & Koristashevskaya, 2019; Lunt & Curran, 2010).

Accordingly, with the rapidly changing trends in education, feedback research has transformed to separate its focus on the feedback provider (instructor) and the feedback receiver (students). An increasing number of studies identifying the feedback outcome from a student's standpoint have been published (e.g., Blair & McGinty, 2013; Deeley et al., 2019; Kim, 2005; Poulos & Mahony, 2008; Pokorny & Pickford, 2010). Subsequently, educational research has centered upon the feedback receiver to monitor and evaluate the feedback provider's ability in fulfilling students' needs, preferences, and values of feedback. However, only a few studies clearly explain how certain characteristics of feedback influence student learning in relation to their cognitive, motivational, and behavioral variables. Effective feedback, from students' perspectives, not only stimulates their cognitive process but also affects their feelings of self, which ultimately influences their use of the feedback.

In conclusion, student perception of feedback provides important evidence for determining the feedback quality of instructors. To further understand the characteristics of effective feedback, there is a need to simultaneously determine the possible outcomes of student learning as a result of the feedback.

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1.1. Statement of the Problem

In recent decades, student-centered learning has been given increasing focus in higher education, encouraging students to take an active role in their learning process (McCabe & O'Connor, 2014). The main difference between being a high school student and a university student is that undergraduate students are responsible for their own learning, where one of the essential aspects is being able to reflect on feedback (Quinton & Smallbone, 2010). Thus, feedback offers students a base for reflection and self-regulatory strategies for furthering their own learning, with a growing body of research in the context of higher education acknowledging the importance of feedback (Evans, 2013). The most widely accepted view of feedback according to the literature on higher education emphasizes students' poor implementation of teacher feedback (e.g., Kim & Sohn, 2021; Price, Handley, & Millar, 2011), but there is little evidence about what type of feedback is best in certain situations and contexts (Mutch, 2003). An increasing number of studies have since started to identify effective types of feedback and the resultant outcomes from student perspectives (e.g., Blair & McGinty, 2013; Small & Attree, 2016).

Data on undergraduate students' perceptions of feedback has been collected through surveys (e.g., Huisman et al., 2018; Scott, 2014; Strijbos, Pat-El, & Narciss, 2010) and interviews (e.g., Murphy & Cornell, 2010; O'Donovan, Price, den Outer, & Lloyd, 2021). However, in the meta-analysis by Van der Kleij and Lipnevich (2020), a limitation was found in the survey methods in the sense that insufficient sampling was gathered and that instrument validation was not conducted. Furthermore, surveys in prior studies were mostly based on literature reviews. Therefore, a common limitation identified in these survey methods is that students' opinions were not thoroughly explored, which excluded potential opportunities to gain rich and important information on students' opinions of effective feedback and related outcomes.

Studies involving interviews regarding students' perspectives of the usefulness of effective feedback and preferences thereof have often been described, with several studies (e.g., Deeley, 2019; Jönsson, 2013) revealing that students acted on feedback

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depending on the type of feedback information (students want detailed and applicable feedback). The limitations of studies using interviews is that the findings cannot be generalized. Furthermore, qualitative studies of feedback often focus on either the characteristics of useful feedback or its impact on learning outcomes (Deeley et al., 2019; O'Donovan et al., 2021) which could explain the inconsistent patterns of results in prior feedback research. It is crucial for instructors to understand both the characteristics of effective feedback and the feedback outcomes to further improve their feedback practices in the classroom. Questions about instructor feedback and teaching quality have often been integrated into student evaluation in higher education, but existing instruments only ascertain whether the instructor has delivered useful feedback on students' understanding of the course material (Mulliner & Tucker, 2015).

Developing an instrument for measuring answers to the questions "What are the factors determining effective feedback?" and "What are the outcomes of receiving effective feedback?" is seen as important (DeVellis, 2012). While educational experts have asserted that feedback is an important construct in education (Black & William, 1998; Hattie & Timperley, 2007), only a few researchers (e.g., Kim & Sohn, 2021) have developed a validated instrument to simultaneously measure the characteristics of effective feedback and outcomes after receiving feedback. There is a need to investigate beyond solid characteristics of effective feedback to understand the outcome on student learning, especially considering the positive influence of feedback on student learning. The development of a feedback instrument in higher education is crucial for instructors to reflect on their own feedback practices to develop and enhance their expertise and feedback quality.

Furthermore, feedback instruments used in previous studies mainly measured the general quality of feedback (e.g., Kim & Sohn, 2021), behavioral changes after receiving feedback (e.g., Jellicoe & Forsythe, 2019), affective influences of feedback (Linderbaum & Levy, 2010), and feedback literacy (Park & Sohn, 2019). Since existing feedback instruments (e.g., Jellicoe & Forsythe, 2019; Kim & Sohn, 2021; King, Schrodt, & Weisel, 2009; Park & Sohn, 2019) have not captured all aspects of the characteristics of effective feedback or the feedback outcomes, there are possible limitations in revealing the phenomena of the overall feedback practice in higher

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education. A feedback instrument that encompasses both of these aspects may provide a guideline for instructors to reflect on how their feedback functions in the classroom. Furthermore, instructors will be able to modify their feedback practices by gaining insight into how their feedback influences student learning.

Studies (e.g., Morgado et al., 2017) suggest using a combination of deductive and inductive approaches for the development of an instrument to enrich the quality of research about feedback. Deductive approaches are based on the theoretical definitions and conceptualization of construct (Swanson & Holton, 2005) which is then considered for the development of the items (Schwab, 1980). In inductive analyses, items are generated by gathering answers from respondents about their experiences relevant to the existing construct of interest (Yi, 2009). The responses serve to discover specific items which can be included in existing constructs.

This study aims to use both deductive and inductive approaches for the development and validation of an 'Effective Feedback' Instrument (EFI), assuring the theoretical definition of the construct, and integrating students' perspectives to enrich the insights of the 'characteristics of effective feedback' and the 'feedback outcome' in higher education.

1.2. Purpose of the Study

The purpose of this study is to develop and validate the 'Effective Feedback' Instrument (EFI) by investigating the 'characteristics of effective feedback' and the 'feedback outcome' in higher education based on the literature review and students' perceptions.

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1.3. Research Questions

The present study addresses four questions:

1. How is the 'Effective Feedback' conceptualized?
   1-1. What are the characteristics of 'Effective Feedback' for student learning?
   1-2. What are the outcomes of 'Effective Feedback' for student learning?

2. How valid and reliable is the instrument for 'Effective Feedback?'

2. Literature Review

This chapter describes the definition of feedback from broad aspects of learning theory perspectives, it outlines the empirical research on the characteristics of effective feedback and the outcomes, and presents relevant studies in the field of feedback research in higher education.

2.1. Definition of Feedback

There is no universally and commonly agreed definition of feedback (Ramaprasad, 1983), as definitions depend on theoretical perspectives and instructional goals. Hattie and Timperley (2007) defined feedback as "information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding." Butler & Winne (1995, p. 275) stated that "Feedback is information with which a learner can confirm, add to, overwrite, tune, or restructure information in

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memory, whether that information is domain knowledge, meta-cognitive knowledge, beliefs about self and tasks, or cognitive tactics and strategies." Burke and Pieterick (2010) stated our understanding of the concept of feedback can be complicated because it has undergone paradigm shifts over time.

The systematic study of feedback by experimental psychologists has its origin in Thorndike's law of effect perspective and it acted as a type of a "reinforcer", functioning as a reward or punishment to increase the probability of a desired response (Kulhavy & Stock, 1989). This principle developed into Skinner's (1954) behaviorist perspective. In line with Thorndike's law of effect, Skinner's definition of reinforcement is that the future response is increased when that response has been previously experienced through the reinforcement. Thus, feedback would reinforce the learner's response with the goal of eliciting it again under similar conditions (Wager & Wager, 1985).

By the 1970s, the cognitive perspective drew attention to the importance of the way information was processed by the learner where feedback is seen as corrective (Evans, 2013; Guthrie, 1971). Kulhavy et al. (1977) defined feedback as information that is used to tell a learner if a response is right or wrong. Furthermore, the use of computers for educational purposes increased rapidly by the 1990s (Mason & Brunin, 2001), and feedback in the computer instructional sense was defined as a message or display that the computer presents to the learner after a response (Wager & Wager, 1985). Thus, feedback in the cognitive view was defined as "corrective information" (Mory, 2004).

Scholars stated that defining feedback solely as "information" in response to someone's action is too vague, emphasizing that feedback should help the student understand the learning goal and present state in order to close the gap between their current status and the desired outcome (Narciss, 2008; Ramprasad, 1983; Sadler, 1989). This focus is grounded in the cognitive paradigm and indicates that learning is achieved by addressing discrepancies in knowledge. Thus, scholars with the cognitive view also defined feedback as information that compares the actual performance with the desired outcome (Mory, 2004). When a student notices a gap between the performance and outcome through monitoring, the student may use the feedback to close the perceived

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gap (Butler and Winne 1995; Winne 1996).

The metacognitive theory emphasizes learners' knowledge about cognition and regulation thereof (Brown, 1987). Nicol and Macfarlane (2006) stated that defining feedback as acting only as a transfer of information would exclude how feedback interacts with student motivation and belief. They defined feedback as "a source against which students can evaluate progress and check out their own internal construction of goals, criteria, and standards." Thurlings et al. (2013) noted that this is related to the "learning to learn" processes that facilitates self-regulated learning. Teachers guide learners through the learning process and, by self-directed learning, they get to know what is known or unknown (Schoenfeld, 1987). Based on this, the learner can build learning strategies and self-monitor their learning progress. The shift toward student-centered learning emphasized learners as receivers of the feedback message who ultimately interpret and use the message (Sadler, 2010).

Feedback, as described above, is still considered a one-way transformative process from teachers to students (Boud & Molloy, 2013; Evans, 2013; Sadler, 2010). The social constructivist view focuses on learners' active engagement in constructing knowledge through social processes and action where the teacher acts only as a guide (Lee, 2018; Thurlings et al., 2013). Carless (2016) defined feedback as a dialogic process: "Feedback involves dialogic processes whereby learners make sense of information from various sources and use it to enhance their work or learning strategies." (p. 1). This definition highlights the social nature of feedback as students play an integrated role in the process. As a result, in the social constructivist approach, students' views are placed at the center of the classroom with dialogue playing an essential role in learning.

It is assumed that learning theorists view feedback in different ways. For instance, behaviorists view feedback as a catalyst to reinforce the behavior. Cognitive theorists show importance in providing corrective information for the learning process, and metacognitive theorists focus on self-regulated learning. Moreover, the social constructive approach sees feedback as an interaction and dialogue. It is not about whether one specific aspect is superior to others in determining effective feedback. To understand the precise nature of the feedback process, all aspects should be considered because

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they supplement one another in achieving the learning outcome. The classroom is a complex environment where teacher feedback can support students' behavioral, cognitive, self-regulational, motivational, and interactive engagement.

Hence, attempting to close the discrepancy between these aspects of feedback, this research aims to define feedback as any communication or procedure where learners obtain information about their work for improvement, promoting motivation to close the gap between the actual performance and the desired outcome (Boud & Molloy, 2013; Carless, 2016; Cohen, 1985; Kulhavy, 1977; Mory, 2004). See <Table 1> for an overview of feedback definitions from the cognitive to the social constructivist perspectives. As scholars with behavioral perspectives viewed feedback as a "reinforcer", there was no definition of feedback from the behavioral aspect.

<Table 1> Definition of feedback

Author(s), Year, Page	Definition of Feedback
Kulhavy (1977, p. 211)	"Any of the numerous procedures that are used to tell a learner if an instructional response is right or wrong."
Narciss (1999, p. 3)	"Feedback is regarded as a source of information necessary for verification, elaboration, concept development, and meta-cognitive adaptation."
Shute (2008, p. 1)	"Information communicated to the learner that is intended to modify the learner's thinking or behavior for the purpose of improving learning."
Butler & Winne (1995, p. 275)	"Feedback is information with which a learner can confirm, add to, overwrite, tune, or restructure information in memory, whether that information is domain knowledge, metacognitive knowledge, beliefs about self and tasks, or cognitive tactics and strategies."
Ramaprasad (1983, p. 4)	"Information about the gap between actual performance level and the desired standard, which is used to alter the gap."
Boud & Molloy (2013, p. 6)	"A process whereby learners obtain information about their work … in order to generate improved work."
Nicol & Macfarlane-Dick (2006, p. 208)	"A source against which students can evaluate progress and check out their own internal construction of goals, criteria and standards."

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Author(s), Year, Page	Definition of Feedback
Hattie and Timperley (2007)	"Information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding."
Ilgen, Fischer, & Taylor (1979, p. 349)	"A special case of the general communication process in which some sender (hereafter referred to as a source) conveys a message to a recipient."
Carless (2016, p. 1)	"Feedback involves dialogic processes whereby learners make sense of information from various sources and use it to enhance their work or learning strategies."

The common goal of feedback is to provide information about the goal and to bridge the gap between what students know (current performance) and what they need to know for achieving the goal (Hattie & Timperley, 2007; Sadler, 1989). Empirical evidence shows that one function of feedback is to correct initial errors (Butler & Karpicke, 2008) for performance improvement. Another function is to facilitate learners' motivation and to fulfill emotional needs (Brookhart, 2017; Narciss & Huth, 2006; 1987; Pat-El et al., 2012; Pekrun et al., 2014). An underlying mechanism of feedback is to enhance learners' efforts to engage with feedback, which would lead to an increase in performance (Kluger & DeNisi, 1996) and enhancement in future motivation.

2.2. Effective Feedback

According to previous studies, different types of feedback are classified by the valence, timing, and content of the information (Finkelstein & Fishbach, 2011; Golke, Dörfler, & Artelt, 2015) that affect overall student learning (Hattie, 2007; Mory, 2004) and motivation (Burnett & Mandel, 2010) to remain engaged in the learning process. The research literature on the power of feedback showed considerable variability, with some types of feedback being more powerful than others, revealing inconclusive results about which feedback is better for outcomes (DeNisi & Kluger, 2000).

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2.2.1. Feedback Valence - positive vs. negative

Feedback valence refers to whether the feedback is positive or negative (e.g., Kluger & DeNisi, 1996). When we first think of feedback, praise or criticism may initially arise in our minds. Positive feedback relates to strengths and correct responses, whereas negative feedback relates to weaknesses and errors (Finkelstein & Fishbach, 2011). One assumption is that individuals may prefer positive rather than negative feedback, and the other is that positive feedback, such as praise, enhances the willingness to improve toward successful achievement. Therefore, as both positive and negative feedback affect students' emotional level, both cause students to either avoid or accept the feedback, respectively. It is, however, not necessarily obvious that positive feedback leads to feedback acceptance or that negative feedback leads to avoidance in students.

In the classroom context, positive feedback is important because the sense of appreciation and support is a great motivator to continue learning. Positive feedback enhances performance (Kluger and DeNisi, 1996) and self-efficacy (Brown et al., 2012), and can be delivered as a form of praise directed at the person or the person's performance (Hattie & Timperley, 2007; Corpus & Lepper, 2007). There are several levels in the form and specificity of praise that students receive about their work, with scholars cautioning that praise given in wrong ways can be ineffective (Brophy, 1981; Mueller & Dweck, 1998) or even cause a decline in future performance (Meyer, 1992).

One dimension of praise is in considering it as a reinforcer for positive behaviors (Brophy, 1981). This kind of praise was previously called positive verbal reinforcement and its main goal was to improve learners' classroom behavior (Deci, 1972; Thomas, 1991; Hall, Lund, & Jackson, 1968; Moore et al., 2019). Verbal reinforcement has been widely researched because it influences intrinsic motivation (Harackiewicz, 1979; Vallerand & Reid, 1984). Deci (1972) investigated the effects of external rewards (reward and verbal reinforcement) on intrinsic motivation. He distinguished two aspects of the external reward: the "controlling" aspect and the "information" or "feedback" aspect. Providing rewards such as financial incentives, decreased motivation in learners because it acted as a controlling function. In contrast, verbal reinforcement (without money) acting as feedback, increased intrinsic motivation because it enhanced the

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competence and self-efficacy of learners. Similarly, several studies have compared controlling verbal praise with informational praise and found that feedback provided in a controlling manner was destructive to learners' motivation (Deci, Koestner, & Ryan, 2001).

Motivational research is referred to as attributional praise (Pintrich & Schunk, 2002; Weiner, 1979), distinguished into ability praise ("Well done! You are really smart.") and effort praise ("You are trying really hard."). Ability praise is a way to provide feedback on a good performance that functions as a boost to learner's perceived efficacy and motivation (Koestner, Zuckerman, & Koestner, 1989). Early research has demonstrated that praise for ability is most valued (e.g., Brown & Weiner, 1984; Marsh, 1990; Nicholls, 1976). A growing body of research, however, states that effort praise is critical in promoting sense of self-efficacy (Schunk, 1986; Burnett et al., 2010; Mueller & Dweck, 1998). The study by Burnett (2010) investigated what feedback elementary students found most helpful, and the result showed that effort feedback was preferred to that of ability. Schunk (1991) presumed that students' need for effort feedback might occur in the early years, but with increasing age, the preference for ability feedback may enhance (Burnett, 2001). Thus, research comparing ability praise with effort praise has been mainly investigated on children (e.g., Kamins & Dweck, 1999; Mueller & Dweck, 1998; Burnett, 2011; Brummelman et al., 2014).

In a study investigating university students, Straub (1997) noted that despite students' appreciation of praise, they did not always find it useful or helpful (Fong et al., 2013). Fong et al. (2017) found that some students doubted the truthfulness of positive feedback with one student, stating that receiving praise felt as if it was just out of pity or disinterest. Thus, premature and unnecessary positive feedback might confuse students, which may lead them to avoid revision (Hyland & Hyland, 2001). Hattie and Timperley (2007) noted that praise is not effective on student achievement if it only focuses on the person ("Good girl!") and not the task. Moreover, task-related praise leads to students' increased engagement and commitment to learning, resulting in a deeper understanding of the task (Burnett & Mandel, 2010).

Several studies have consistently reported that praise is positively related to self-efficacy (Bandura, 1977; Pajares, 2003), so it is plausible to argue that, with

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increasing age, some amount of praise an individual's ability might be helpful for students. However, it should not be provided exclusively but rather combined with informational feedback explaining what was done well. Scholars suggested that positive feedback could enhance student motivation if it involved carefully chosen words with a clear description of why the student is being praised (Straub, 1997; Thomas, 1991). Some findings from the literature suggested that students who received encouraging comments about their tasks had positive attitudes and tended to invest more effort into the assignment (e.g., Mueller & Dweck, 1998).

Educators should, therefore, provide positive feedback combined with constructive encouragement, which involves acknowledging students' improvements and efforts with genuine comments considering their feelings (Hitz & Driscoll, 1994). This form of feedback not only promotes students' self-esteem but also feedback-seeking behavior. Thus, it is evident that students value constructive information balanced with affirmative evaluations about their tasks.

Fong et al. (2019) defined negative feedback as "negative evaluations made by a person of another's products, performances, or attributes, where the evaluator presumes the validity of the standards on which the evaluation is based." (p. 122). A great number of studies suggest that negative feedback is less effective than positive feedback (e.g., Hu et al., 2017; Ilgen & Davis, 2000; Peifer et al., 2020), with the common assumption that individuals avoid criticism about their performance (Baron, 1993) because it threatens their self-esteem and feelings of competence. Such feedback, however, may be necessary at times as it serves as a motivator for one to accomplish their commitments (Cianci et al., 2010; Fong et al., 2019) and leads one to reflect thoroughly on their past performance. In fact, Deci and Cascio (1972) stated that a small amount of criticism might act as a challenge and stimulation for change. Other studies report that criticism is more effective at improving skills than praise (Kannappan, 2012). Thus, negative feedback may be necessary for a change in performance by letting one know that a gap between actual and desired performance exists (Ilgen & Davis 2000). Overall, if negative feedback is seen purely as a corrective practice, it would be unavoidable as it is a part of a process that reveals how well one is performing (Dahling & Ruppel, 2016). Unlike positive feedback, the

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aspects of negative feedback are created differently that is, whether the negative feedback is seen either as destructive or constructive criticism.

Destructive criticism involves strong feelings of anger, including sarcasm and threatening tone. Such feedback often attacks a person's character rather than the behavior, which may be perceived as an insult (Baron, 1990; Harolds, 2013). On the other hand, negative feedback may be less detrimental if it served as constructive criticism indicating a need for change in performance (Baron, 1988; Dweck & Leggett, 1988; Sprouls, Mathur, & Upreti, 2015). Baron (1988) the outcomes of constructive and destructive feedback on 83 undergraduate students' works. He defined constructive criticism as remarks which were specific in content, considerate in tone, did not attribute poor performance to internal causes, and were non-threatening. Destructive criticism was defined as remarks which were general, inconsiderate in tone, attributed poor performance to internal factors, and were threatening. His results indicated that students who received constructive feedback reported higher self-efficacy and higher self-set goals, as well as lower anger and tension.

Fong et al. (2016) revealed that some students saw constructive criticism, including information of their strengths and weaknesses, as providing specific guidance toward improvement in a kind way. Other students who perceived constructive criticism as more disapproving, felt unpleasant emotions. Thus, positive constructive criticism could lead to enhanced motivation and reception of feedback (Fong et al., 2018).

According to the meta-analysis of Fong et al. (2019), negative feedback, compared with positive feedback, decreased intrinsic motivation of preschool, high-school, and college students. Constructive criticism that included informative factors about students' performance was found to enhance intrinsic motivation as opposed to feedback without any supporting information.

It is important to accommodate students' emotional aspects upon receiving feedback (Archer, 2010). Finkelstein et al. (2010) stated that "positive information should not be needlessly flattering and negative information should not be unnecessarily detrimental." (p. 2). Feedback providers should be aware that feedback designed to motivate is highly valued by students. Motivating feedback, therefore, care is should be constructive that gives guidance or information on how a student could improve for future tasks.

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2.2.2. Timing of Feedback - immediate vs. delayed

One aspect of feedback that received much attention in literature was the timing of delivery (Dempsey & Wager, 1988). Immediate feedback is usually provided right after a student has responded to a question or task. Some scholars who investigated students' perspectives of feedback accept that immediate feedback could correspond to one to two weeks after students submitting the tasks (Bohnacker-Bruce, 2013). Moreover, there is no universal definition for delayed feedback because the degree of delayed feedback has varied widely (Van der Kleij et al., 2011). Thus, it is important to understand the wide Several scholars have extensively researched whether feedback should be immediate or delayed, and have produced highly conflicting results (e.g., Brand et al., 2020; Dihoff, Brosvic, & Epstein, 2003; Kulhavy & Anderson, 1972; Metcalfe, Kornell, & Finn, 2009; Shute, 2008; Surber & Anderson, 1975). The timing of feedback is a critical aspect of learning as it serves several purposes, namely: (1) increasing the accuracy of future correct responses, (2) preventing the number of incorrect responses, (3) decreasing the interference with learning the correct response, and (4) increasing the opportunity to consider and reflect on alternative approaches to a problem or task.

From the view of behaviorism which focuses mainly on reinforcement (Scheeler et al., 2010; Van Houten, 1984), feedback should be given immediately to enhance correct responses and eliminate incorrect responses (Skinner, 1954). Studies with cognitive perspectives, however, have yielded mixed results regarding the effects of immediate and delayed feedback (e.g., Butler et al., 2008; Kulik & Kulik, 1988; Metcalfe et al., 2009). Nevertheless, immediate feedback is easily provided in a computer-based environment, since it is automatically given right after the students' responses (Van der Kleij, Feskens, & Eggen, 2015). This form of immediate feedback could not only prevent the repetition of the future errors but also reinforce correct answers (Kulik & Kulik, 1988; Shute, 2008).

Schmidt et al. (1989) stated that immediate feedback could make learners rely on the automatically provided answers and block their innate senses to find errors. Thus, caution is necessary when providing immediate feedback, as learners could take advantage of the quickly provided feedback without deeply understanding the task and

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the information. Furthermore, they may not gain the motivation to observe various aspects related to the task, but instead, becoming too comfortable instead by either recalling past quizzes or simply guessing the answers.

In the early 1960s, a series of studies stated that learning was enhanced when feedback was provided in a delayed manner, which was called delay retention effect (e.g., Brackbill, Bravos, & Starr, 1962; Brackbill, Isaacs, & Smelkinson, 1962). Kulhavy and Anderson (1972) proposed to view learners' processing of feedback according to the interference-perseveration theory. It is suggested that delayed feedback will be more effective in that it allows the initial incorrect answer to be forgotten over time, resulting in less interference arising while learning the correct answer (Dempster, 1989; Kulhavy & Anderson, 1972; Metcalfe et al., 2009). This theory is especially relevant to the retention tasks in a delayed post-test (Swindell & Walls, 1993). Thus, research findings postulate that the benefit of delayed feedback may take longer to emerge, but is more effective than immediate feedback for correcting initial wrong because there may be a decrease in response competition (Butler, Karpicke, & Roediger, 2007; Butler & Roediger, 2008).

Research evidence also suggests that delayed feedback may be more effective for higher-level tasks (Clariana, Wagner, & Murphy, 2000; Mory, 1992) whereas immediate feedback is effective for lower-level tasks (Van der Kleij, 2013). Thus, task difficulty would be another important factor to consider in research. However, the effect of delayed feedback was only found in experimental situations and not in applied studies. Kulik and Kulik (1988) conducted a meta-analysis of 53 studies on the impact of immediate and delayed feedback and found that one of eight studies on feedback-timing involved multiple-choice tests resulting in a positive effect of delayed feedback. In contrast, applied studies yielded the opposite with preference to immediate feedback (Smith & Kimball, 2010). Research findings on feedback-timing pose the following challenges: there is a variety of ranges in immediate and delayed feedback. Dempsey and Wager (1988) state, "Often, one researcher's immediate feedback is another's delayed," indicating the difficulty in generalizing study results.

Social constructivist perspectives suggest that learners are more likely to respond and show interest in feedback when it is delivered immediately (Van der Kleij et al., 2012).

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However, with the increase in exploring student perception of feedback, the timing thereof has extended to encompass the term “timeliness,” suggesting that the definition of immediate and delayed feedback is not black and white as in that of behavioral and cognitive views. The need for timely feedback was often mentioned in studies investigating the quality of feedback on assignments (e.g., Ajjawi et al., 2021; Li & De Luca, 2014; Mulliner & Tucker, 2015; Murphy & Cornell, 2010; Poulos & Mahony, 2008; Price et al., 2010), and one of the factors influencing the likelihood of feedback being used by students. Poulos and Mahony (2008) investigated the perspectives of undergraduate students’ at the Faculty of Health Sciences on effective feedback. Students’ perceptions relating to the timeliness of feedback depended on the usefulness of such feedback for their future assignments, with prompt feedback letting students know what to improve. Interestingly, delayed feedback was also considered useful if it related to future assignments. Thus, students’ perception of timely feedback seems to depend on their interpretation of whether or not the feedback is viewed as a learning opportunity to apply to prospective assignments.

In sum, a appropriate timing to give feedback is valid until the learner holds interest in the task with a readiness to exert more effort for improvement.

2.2.3. Content of Feedback - verification vs. elaborated

Literature on feedback generally agrees that even a small amount of feedback is more effective to learning than no feedback (Bangert-Drowns et al., 1991; Narciss, 2004), and certain feedback types are considered essential for feedback outcome (Bangert-Drowns, 1987; Ellis, 2009). However, it is not completely clear which form or content of feedback is seen as maximally effective.

The feedback outcome is influenced by the content (Bangert-Drowns et al., 1991; Golke, Dörfler, & Artelt, 2015; Kulhavy & Stock, 1989) and the complexity of the feedback message (Shute, 2008). For example, feedback may indicate whether a response was correct or not, or provide detailed information about the reasons for the

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correct or incorrect answer. According to Kulhavy and Stock (1989), the content of the feedback information can be divided into “verification” and “elaboration.” Verification feedback, traditionally called “knowledge of response” (KOR) (Mclaughlin, Rogers, & Fisk, 2006; Narciss, 2004; Schimmel, 1988; Shute, 2008), only provides information about the correctness of the answer. Mason and Bruning (2001) further categorized the “answer until correct” (AUC) protocol into verification feedback, which usually occurs in computer-based programs.

Elaborated feedback is more complex in that it provides additional information after verification, which may involve an explanation of why the answer is right or wrong. Providing hints or solutions in the learning process also could be a part of this form of feedback (Van der Kleij, 2013).

It must be noted that the degree of elaborated feedback can differ widely. Kulhavy and Stock (1989) distinguished elaborated feedback into three categories: (1) task-specific (providing the correct answer, which refers to knowledge of correct response), (2) instruction-based (explaining why an answer is correct or locating the text passage regarding the right answer), and (3) extra-instructional (providing new information to clarify the learning material).

Taking a different approach, Shute (2008) noted that there is a lack of a broad overview to determine the complexity of feedback; thus, categorized nine feedback types arrayed from least to the most complex. This categorization is significant because attention is drawn to six subtypes of elaborated feedback.

<Table 2> summarizes the categories of verification feedback by Kulhavy and Stock (1989) and elaborated feedback by Shute (2008), showing the degree and complexity of the latter.

<Table 2> Synthesized feedback types generated from Kulhavy & Stock (1989), and Shute (2008)

Verification/ Elaboration	Feedback Type	Description
Verification (Kulhavy & Stock, 1989; Shute, 2008)	Knowledge of Response (KOR)	Indicates whether the answer is correct or incorrect but provides no other information
	Answer Until Correct Feedback (AUC)/ Multiple-Try	Provides KOR feedback and requires the learner to remain on the same task until the correct answer is found

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Verification/ Elaboration	Feedback Type	Description
	Feedback (MTF)/	
	Knowledge of Correct Response (KCR)/ Answer Feedback	Provides the correct answer after informing whether the answer is correct or incorrect
General Elaboration (Kulhavy & Stock, 1989; Shute, 2008)	Elaborated Feedback (EF)	Referred to information that include additional instruction-based or extra-instructional information
Elaboration (Shute, 2008)	Attribute Isolation	Describes the target concept or skill to be learned
	Topic-contingent	Provides the learner with information about the learning goals in relation to the topic being studied. It might include re-teaching the material
	Response-contingent	Describes why the answer is wrong and why the correct answer is correct, without explicit error diagnosis
	Hints//cues/prompts	Provides hints that guide the learner in the right direction. It does not present the correct answer.
	Bugs/misconceptions	Provides information about the learner's specific errors or misconceptions (e.g., what is wrong and why).
	Informative tutoring	Presents verification feedback, error-flagging, and strategic hints on how to continue, without providing the correct answer

Literature generally agrees that feedback providing the correct response is superior to verifying feedback that only indicates if the answer is right or wrong (Pashler, Cepeda, Wixted, & Rohrer, 2005). Furthermore, several studies have shown that elaborated feedback is more effective in learning than simple types of feedback like verifying feedback or feedback only providing the correct answer (e.g., Butler, Marsh & Godbole, 2013; Chase & Houmanfar, 2009; Hattie & Timperley, 2007; Moreno, 2004; Van der Kleij, 2013; Van der Kleij, Feskens, & Eggen, 2015; Wang et al., 2019). In contrast, some studies revealed that elaborated feedback had little effect on learning or performance compared to simpler feedback types (e.g., Broek et al., 2019; Kornell & Vaughn, 2016; Iterbeke, De Witte, & Schelfhout, 2020; Schimmel, 1983; Kulhavy et al., 1985; Pridemore & Klein, 1995).

There are a great number of variations of elaborated feedback indicating one reason for the inconsistent results in the literature. For instance, Broek et al. (2019) explored whether elaborated feedback involving hints is more effective in a recall test several

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days after the retrieval practice compared to the knowledge of correct response feedback (KCR). After the initial practice of translating English words into Dutch, only English words were shown to students which they had to recall and translate. In the KCR condition, the word and its translation were presented to students, whereas students received three different kinds of feedback (orthographic, mnemonic, cross-language) in the hints feedback condition. During practice, hints did not reduce repeated errors. In the later recall test, the overall number of words that students recalled was not significantly different in the two conditions. Note that this study and several others (e.g., Butler, Godbole, & Marsh, 2013; Finn, Thomas, & Rawson, 2018; Marsh, Umanath, Bjork, & Bjork, 2012) that investigated diverse types of elaborated feedback used final tests that assessed learner's retention of the correct answer by repeating the same questions from initial practices or tests.

With a different approach, Finn et al. (2018) investigated whether elaborated feedback involving specific examples would facilitate conceptual understanding. The two conditions consisted of Feedback-Only and Feedback-Plus-Example groups. In the initial phase of Experiment 1, participants studied a set of judgment and decision-making terms and definitions related to psychology. In the second phase, each previously studied definition was presented, and the feedback intervention was introduced to participants who were randomly assigned into one of the two groups, showing the correct term. For both groups, the correct answer was provided, but the Feedback-Plus-Example group additionally received the "concept example" of the tested concept and was allowed to review the examples multiple times. A final cued recall test was conducted in which the participants received either the previously studied definition or a new example and were prompted to provide the correct concept term. The results revealed that the Feedback-Plus-Example group correctly recalled more of the concepts than the Feedback-Only group. In Experiment 2, the final test involved classification tests of both previously studied definitions and new examples of concepts, with the Feedback-Plus-Example group outperforming the Feedback-Only group, especially in classifying new examples. This study implied that elaborated feedback with examples could promote learning and the transfer of knowledge to a new context. Thus, elaborated feedback is thought to be more effective in enhancing learning in that it

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helps to connect the learned concept to a new context compared to tasks requiring simple retention.

Moreover, studies included in feedback meta-analyses (e.g., Azevedo & Bernard, 1995; Bangert-Drowns et al., 1991; Jaehnig & Miller, 2007; Swart et al., 2019; Van der Kleij et al., 2011) compared elaborated feedback with KOR and KCR feedback, and with the no-feedback condition to investigate the impact of feedback on learning in a computer-based environment. According to the meta-analyses, elaborated feedback showed mixed results on the outcome with an extensive range of effect sizes. (Bangert-Drowns et al., 1991; Schimmel, 1983). What may be of more interest is that in-depth elaborated feedback is effective for complex tasks containing difficult questions. Chase & Houmanfar (2009) investigated the effects of elaborated feedback compared to that of simple feedback and concluded that participants who answered incorrectly in the quiz benefitted from the elaborated feedback because they got to understand why they were incorrect. Furthermore, it was suggested that the impact of feedback may differ in relevance to the level of question difficulty. This result could explain why, in some cases, elaborated feedback is superior to KOR or KCR feedback and, in other cases, not.

Kulhavy (1985) assumed that the greater the amount of feedback information, the higher is the possibility of understanding why the answer is incorrect. However, some studies indicate that feedback with too much information could be detrimental to performance (Glover & Brown, 2006; Shute, 2008). If the feedback message is too lengthy and complex, the information may not be read by learners, which could decrease the impact of feedback. These results derive from an exploratory research method with written feedback on students' assignments (e.g., Ferguson, 2011) rather than from quantitative methodology like test situations.

Therefore, to explain the inconsistencies in the literature of what effective feedback entails, the methodological variabilities in such studies need to be taken into account and summarized as (1) the diversity of timing of the feedback provision (Kluger & DeNisi, 1996), and (2) the complexity of elaborated feedback (Golke et al., 2015).

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2.2.4. Functional Feedback - directive vs. facilitative

Another line of research on effective feedback is focused on the autonomy-supportive and student-centered ways of providing feedback (e.g., van den Bergh, Ros, & Beijaard, 2013; Straub, 1996). As previously mentioned, several studies have shown that elaborated feedback is most effective for learning (e.g., Chase & Houmanfar, 2009; Clariana, 1990; Pridemore & Klein, 1995); however, students may sometimes perceive feedback as authoritative and teacher-based. Some scholars stated that teachers' guiding principles and the class structure have an impact on the ways of giving elaborated feedback (van den Bergh et al., 2013; Ransdell, 1999).

Straub (1996) identified two types of feedback according to their functions: directive feedback and facilitative feedback. Directive feedback is related to elaborated feedback whereby specific information is given to students about what needs to be corrected. By receiving specific answers, students may become somewhat passive in their learning, and it may also seem as controlling (Straub, 1996). On the other hand, facilitative feedback is used to initiate active involvement of students in the learning process using hints and suggestions to challenge their knowledge construction, which could be encouraging to students. It is also seen as indirect feedback in that it occurs when the teacher indicates that an error has occurred without providing the correct form. Moreover, Underwood and Tregidgo (2006) noted that the tone of facilitative feedback has an additional impact on students by stating "...a comment can be suggestive, perhaps pointing to an idea or phrase that could use more clarification or focus." It is proposed that feedback should include specific suggestions and choices for students with some acknowledgment as it can affect their self-confidence and motivation (Treglia, 2009).

In a series of studies exploring the quality of teachers' written comments on assignments, students valued facilitative feedback when they perceived the autonomy support from teachers (e.g., Ransdell, 1999; Straub, 1996; Straub, 1997; Treglia, 2009; Underwood & Tregidgo, 2006). Straub (1997) conducted a 40-item questionnaire survey to explore undergraduate students' reactions to teachers' written responses. The data of 142 students described which type of provided feedback was preferred. The results

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revealed that, although students appreciated specific and elaborated feedback, they were put off by feedback that was controlling. They expressed the need for acknowledgment of their writing. This result leads to the assumption that students could make a clear distinction between teachers who offered suggestions for their improvement and teachers just pointing out what needed to be fixed (Kim, 2005). Similarly, Brannon and Knoblauch (1999) observed that teachers who gave directive feedback tended to incline toward a message that "the teacher's agenda is more important" (p. 118), so that it made students passively adapt to teachers' expectations.

Ransdell's (1999) study found that students' preference of directive or facilitative feedback was equally distributed. There were two types of students, one perceiving directive feedback as useful for helping them to clarify what needed to be corrected, and the other needing the opportunity to explore different ways of writing. It was also found that some students often ignored the facilitative feedback provided by the teacher because students possibly perceived that the they had a choice to either accept or neglect.

Straub (1996) suggested that "we should not reject all directive styles of response any more than we should all adopt some standard facilitative style" (p. 246). Balancing directive and facilitative feedback may be more useful because both supplement students' cognitive and affective states. If the directive feedback is perceived as a criticism, the facilitative feedback may play a pivotal role in encouraging and motivating the student to keep engaged with the feedback. <Table 3> shows a distinction between directive and facilitative approaches to feedback.

<Table 3> shows a distinction between directive and facilitative approach to feedback developed from Berghmans, Michiels, Salmon, & Dochy (2014).

<Table 3> Overview of directive and facilitative feedback

Characteristics	Directive feedback	Facilitative feedback
Aims and intentions	Information transmission, directive guiding of student's learning	Indirect guiding, stimulating knowledge construction
Method and strategies	Informing, lecturing, direct answering, explaining, clarifying, summarizing, demonstrating	Questioning, hinting, prompting, probing, guiding, filling-in-the-blank
Students role	Passive, receiver, listener, follower	Active, participant, responsible

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2.2.5. Interactive Feedback

Recent contributions to the literature emphasize the interactional approaches to feedback. By facilitating student engagement, i.e., interacting, students can construct a better understanding of learning (Nicol, 2010). Regardless of well-constructed feedback to correct students' misconceptions, researchers have increasingly criticized that feedback is too often delivered as one-way communication from teacher to student (Blair & Ginty, 2013; Tan et al., 2019; Van den Berghe, Ros, & Beijaard, 2013). The "transmissive" view of feedback that focuses on correcting errors does not consider students' participatory role in the use of feedback as they could easily become dependent on externally provided feedback and guidance (Adie, van der Kleij, & Cumming, 2018).

From a socio-cultural perspective, dialogue between teachers and students and students and their peers is fundamental with the idea that meaning is created from this interaction. According to Bakhtin (1981), dialogue is essential in highlighting how thoughts and the cognitive development of learners are shaped. It also refers to how meanings are created and understood in both written and spoken practices (Steen-Utheim & Wittek, 2017). The teacher needs to act as an interactive rather than an authoritative partner in the classroom (Havnes, Smith, Dysthey, & Ludvigsen, 2012) because it is not the teacher who is in full control of the feedback outcome, but rather the dialogue that leads to promotes (Esterhazy, 2018) the provision of opportunities for students to reflect on a generate internal feedback (Nicol, 2014).

Several scholars use the social-constructive approach of dialogic feedback drawn on Vygotsky's (1978) idea of Zone of Proximal Development (ZPD) (Mercer, 2004; Steen-Utheim & Wittek, 2017). This idea emphasizes the guiding role of a person helping another to develop their knowledge and understanding (Mercer et al., 2004). For instance, the dialogue may involve requesting clarification-questioning and encouraging students to actively participate in the conversation. Thus, the quality of the dialogue between teacher and student is seemingly critical in that teachers and students can detect and resolve misconceptions together (Black & McCormick, 2010; Carless et al.,

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2011). In particular, low achieving students may particularly benefit from the interactional dialogic form of feedback, as the dialogue explains more details of each step to be taken in a task. From this, it can be seen that interaction is more than just "talking."

Both teachers and learners are involved in building on various ideas while interpreting the meaning together; thus, providing support for students to complete a task which, in turn, facilitates their development as independent learners. In this way, teachers gain more insight into students' cognitive, motivational, and emotional aspects, thereby allowing teachers to use appropriate feedback strategies for their students. Frequent interaction through dialogue opens the door for teachers to gain insights about students' understandings and knowledge.

More recently, research has focused on developing frameworks for the dialogic feedback process (e.g., Adie, Van der Kleij, & Cumming, 2018; Yang & Carless, 2013). Adie et al. (2018) created an extended coding framework, built on previous research (Tunstall & Gipps, 1996; Stobart, 2014), to capture teacher-student interactions in feedback conversations. The research was conducted in three schools where six expert teachers and six students (aged 13 to 14 years) participated. Ten to fifteen minutes of one-to-one feedback interactions while reviewing written science and English assessments were video recorded. Sports class consisted of feedback on table tennis performance. Through an in-depth data analysis, the authors found that the style of questioning emerged as an important aspect of the feedback interaction. The value in this research lies in that it also captured students' contributions of feedback interaction to present the nature of different types and levels of feedback conversations to see which types of conversation supported or hindered student involvement. The result showed that any feedback provided as a one-way delivery hindered students' ownership of the feedback message. That is, the feedback interaction was dependent on how opportunities were given for students to participate in the conversation. Feedback in the form of questions that asked students to explain, justify, analyze, and self-evaluate their views and performances invited students into the dialogue interaction.

Yang and Carless (2013) proposed a triangle design consisting of three dimensions: cognitive (the content of feedback), social-affective (the social and interpersonal

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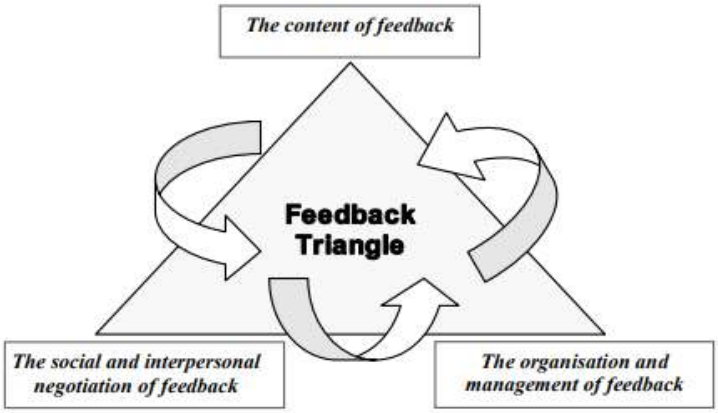
negotiation of feedback), and structural (organization and management of feedback). The cognitive and social-affective dimensions relate to what teachers and students do within the learning context, whereas the structural dimension includes features, such as the utilization of various tools and resources, especially technology, which may influence the overall acceptance of feedback messages. The interactions of these three dimensions act as mutual support, and they all need to be considered to analyze the quality of dialogic feedback. [Figure 1.] shows the dynamic interplay between the dimensions.



[Figure 1] The feedback triangle of Yang and Carless (2013)

The authors stated that the content of feedback (cognitive dimension) is most central to improvement in learning, but the quality might derail if the other two dimensions (social-affective and structural) are not fulfilled (Yang & Carless, 2013). The authors emphasized the role of the teacher to support the social-affective dimension through sensitivity toward students' emotional and psychological states. There is strong empirical evidence that good quality interactions between teachers and students are a feature that represents "effective instruction" (Kim, 2017). Sociocultural researchers emphasize that knowledge and understanding are interlinked by building on reciprocity through the negotiation process (Mercer, 2010).

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2.3. Student Perception of Effective Feedback

Previous studies have indicated that the findings of feedback are inconsistent because the effect sizes vary (Wisniewski et al., 2019). Ajjawi et al. (2021) stated that there is a need to understand what circumstances support effective feedback.

As Winstone et al. (2017) found, motivation and the ability to self-regulate were key to being able to effectively use feedback. Studies have been documenting students' perceptions to determine how they make use of teacher feedback, what types of feedback were appreciated and preferred, and which types motivated them to utilize it for improvement in learning (Deeley et al., 2019; Doan, 2013; Sutton, 2012). There is a growing body of evidence that effective feedback for students provides an opportunity for its use in the future.

Jönsson (2013) conducted a literature review aiming to identify factors that may affect students' use of feedback. A total of 103 studies were reviewed based on feedback on students' assignments, and the researcher conducted a thematic analysis to determine the factors of effective feedback that influenced students' use thereof. The first factor was that the feedback needs to be "useful," providing an opportunity for use in the near future. It was also found that the feedback often came after students had completed a certain module (Hartley & Chesworth, 2000). Thus, it was found that feedback had to be provided during the course learning process (Smith & Lipnevich, 2009).

Second, it was revealed that students appreciated specific, detailed, and individualized feedback. This statement coincides with other studies that investigated students' perception of feedback (e.g., Dawson et al., 2019; Doan, 2013; Weaver, 2006). Simply providing more feedback was not always appreciated, as lengthy feedback could still lack helpful details. Thus, it was important the feedback was personal and referred to the task (O'Donovan, Outer, Price, & Lloyd, 2021).

Finally, students appreciated positive (Ferris, 1995; Rea & Cochrane, 2008) rather than harsh negative feedback (O'Donovan et al., 2021). However, in some cases, positive feedback led students to act passively in relation to improvement (Ferris, 1997),

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so scholars emphasized that, at times, students also need critical feedback (Higgins et al., 2002).

The meta-analysis by Jonassen (2013) revealed that there are diverse strategies for students to use feedback. Some students did not use feedback for future improvements of specific tasks (Furnborough & Truman, 2009), instead, the feedback was a stimulus to put more effort in class, or to gain confidence to ask the teacher for further guidance (Ferris, 1995).

The study of Poulos and Mahony (2008) aimed to identify variables that affect how feedback is perceived by students and found that effective feedback extends beyond finding the most appropriate delivery or time. It was also found that the credibility of the teacher impacted feedback. In line with this study, Kim (2005) explored how students perceived feedback, and it was reported that the aspects of feedback were influenced by students' expectations and trust toward the teacher.

Therefore, student perception of feedback is important to gain insight into the feedback process in the classroom context and to understand how feedback is seen as effective in their learning process. Relying only on student perception, however, could trigger less improvement in general. For example, students may appreciate specific feedback but, at times, providing facilitative feedback to students could lead to better learning in a long term (Van Gog, 2008). Thus, students may perceive some feedback as effective after an amount of time has passed.

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2.4. Effective Feedback in Higher Education

The question of which feedback content is seen as most effective regarding the learning outcome has been highlighted in prior feedback research. However, it is only recently, that there has been renewed interest of feedback research in higher education (Dowden et al., 2013). Feedback has been widely acknowledged as an essential component in research about good and effective instruction (e.g., Lee, 2013; Ramsden, 1991; Sheehan & Duprey, 1999) and emphasized the need for students to actively participate in feedback (e.g., Jönsson, 2012; Nicol, 2010). However, when researchers took a closer look at the feedback phenomenon, students often reported their dissatisfaction with teacher feedback (e.g., Higgins, Hartley, & Skelton, 2001; Deeley et al., 2019). To provide insights of students' thoughts, interview, survey, or mixed methods were commonly performed in studies to investigate students' perceptions of feedback (e.g., Blair & McGinty, 2013; Deeley et al., 2019; Gibbs, 2006; Kim, 2005; Poulos & Mahony, 2008; Pokorny & Pickford, 2010) and why students struggled to use the feedback (Jönsson, 2013). A large amount of research dealt with written feedback of teachers (e.g., Deeley et al., 2019; Hepplestone & Chikwa, 2014; Straub, 1996) on assignments.

For instance, the review of Deeley et al. (2019) emphasized that for students, feedback needs to be "timely, detailed and actionable" (p. 399). Actionable means that written feedback has to be helpful for future assignments, and specific advice was reported to be most important. Especially as grades are critical indicators of academic performance for higher education students, a clear justification of students' grades and identification of their weaknesses were of importance. Moreover, students' motivation clearly enhanced when they received some encouragement with the feedback. Lastly, students found teacher's clear statement about what is expected in assessments as crucial to make learning relevant. Much studies that investigated student perception of written feedback have confirmed the majority of the above findings (e.g., Gibbs & Simpson, 2004; Kim et al., 2014; Dowden et al., 2013; Weaver, 2006).

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Recently, the higher education emphasized the interactive or dialogic feedback between teacher and student resulting in the re-conceptualization of feedback in higher education (Steen-Utheim & Wittek, 2017; Yang & Carless, 2013). Feedback studies investigating student perspectives of feedback (e.g., Blair & McGinty, 2013; Glazzard & Stones, 2019; Pokorny & Pickford, 2010) found that students valued interactive feedback because it allowed them to further ask questions and solve their misunderstandings. Pokorny and Pickford (2010) explored perspectives on feedback through focus group interview of 18 students majoring business in the first and fourth year. The students stated that solely written feedback was not useful except if opportunities to use the feedback for future assignments during the same semester would be provided. They expressed the need for additional face to face interaction with the teacher. These statements implicate that effective learning in the classroom context takes place through interactions because face-to-face interaction was found to be personal and it is delivered immediately so that the teacher can monitor how messages get across to students. Several researchers pointed out that the perceptions and understanding of feedback between teachers and students were different so that students often failed to use the feedback effectively (e.g., Carless, 2006; Orsmond & Merry, 2011).

Mikheeva et al. (2019) compared politeness of instructors in teaching and feedback in an online mathematic course at an university. 277 students were randomly divided into 1) polite instructions and polite feedback, 2) direct instructions and polite feedback. Vocabulary choices and the directness of the words were factors. The result showed that politeness in teaching did not have any influence on the learning outcomes, whereas polite feedback positively influenced students' achievements. It can be concluded that the feedback not only supported students' affect, but also providing a guidance for improvement in an interactive manner.

Thus, the need for more interaction between teacher and students are needed because this, in turn enhances the opportunity for students to understand and make sense of the feedback which is an important key for students to apply the feedback.

Across the studies of higher education, none covered all features of effective feedback, but each study included at least one of the following elements of effective

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feedback. Characteristics of effective feedback identified in the literature review of higher education are shown in <Table 4>.

<Table 4> Effective feedback in higher education

	Pokorny and Pickford (2010)	Price et al. (2010)	Blair & McGinty (2013)	Deeley et al. (2019)	Dowden (2013)	Small & Attree (2016)	Dawson et al. (2018)
Task-specific				○	○		
Clear learning goals and expectations	○			○	○		
Specific/detailed(directive)	○	○	○	○	○	○	○
Constructive (concrete/clear)		○		○	○	○	○
Explanation/ justification of grade	○	○	○	○			○
Pointing strengths and weaknesses	○			○	○		○
Suggestion/ guidance for improvement		○		○	○	○	○
Questioning/ scaffolding					○		
Immediate/ timely	○	○	○	○			
Praise/positive tone/acknowledging/encouraging				○	○	○	○
Individualized			○	○		○	○
Interactive/ dialogic	○	○	○		○		

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Higher-education students benefit from feedback when it helps them not only to understand what or why they did right or wrong but also gives them clear and specific suggestions of how to improve their work, thereby explaining and justifying their grades. Their preference for feedback-dialogue is of increasing importance when clarification for both students and teachers is needed, even though the perceptions of feedback from both sides tend to differ in the literature (Carless, 2006; Price et al., 2010).

2.5. Summary of 'Characteristics of Effective Feedback'

A summary of the characteristics of effective feedback based on the literature review is presented in <Table 5>. The purpose of this summary was to provide an overview of the functions that each characteristics of feedback entails. There are certain characteristics of feedback that are known to be more effective than others (Lipnevich et al., 2020), and the effects of certain feedback characteristics were conflicting in prior research (Kulhavy & Anderson, 1972). However, this study aimed to focus on the effective feedback characteristics based on students' perceptions, rather than from experimental studies (e.g., Corral, Carpenter, & Clingan-Siverly, 2020). Instructions that appear to be effective in experimental studies do not equally reflect classroom practice (Fyfe et al., 2021) and students' perceptions.

<Table 5> Summary of the 'characteristics of effective feedback'

Category	Construct	Examples	Literature
Characteristics of Effective Feedback	Elaborated Feedback	• specific and detailed explanation • addressing to why a specific response was correct or incorrect • additional instructional information about the response • providing worked examples or demonstration	• Bangert-Drowns et al. (1991) • Shute (2008) • Narciss & Huth (2004) • Bruning (2001) • Hattie &

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Category	Construct	Examples	Literature
		• justifying to students how their mark or grade was derived	Timperley (2007) • Blair & McGinty (2013) • Dawson et al. (2018)
	Facilitative Feedback	• providing hints to help initiate finding the right answer • Asking question related to knowledge before providing the answer • Requesting clarification and elaboration on student understanding • suggesting direction for improvement	• Kim et al. (2021) • Finn & Metcalfe (2010) • Straub (1996) • Van den Bergh, et al. (2013)
	Positive Feedback	• Giving positive response (praise, encouragement) about the learning process or outcome	• Butler (1987) • Cole & Chan (1994) • Finkelstein & Fishbach, 2012
	Interactive Feedback	• Interaction for co-construction of knowledge and understanding • Clarification of a statement by reconstructing the meaning • Adding on student's response to make the point clearer	• Steen-Utheim (2019) • Yang & Carless (2013) • Mercer (2004)
	Immediate Feedback	• immediate comments on assignments/providing immediate help	• Lipnevich & Smith (2009) • Benassi et al. (2014) • Booth et al. (2017)

① Elaborated Feedback

Elaborated feedback is defined as feedback that includes any additional information beyond verification or presenting the correct answer (Golke et al., 2015). There is a general order from simple elaborated feedback type through more elaborated variations of feedback. The simplest form of an elaborated feedback could contain information of why the answer was correct or incorrect after a verifying if the answer was correct. The complexity of the reasoning will vary depending on the length. Another elaborated form of feedback could be the presentation of an example of how an ideal answer could look like. Mason and Bruning (2001) stated that feedback is more effective the

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more elaborated information it contains with exceptions for simple low-level tasks and low achieving students (Brookhart & Mcmillan, 2020).

② Facilitative Feedback

Teachers often assume that feedback needs to be extensive. However, at times, it is important to provide hints and clues to stimulate student thoughts before directly providing the answers. Although it was mainly found that feedback should be specific and clear (Blair & McGinty, 2013; Dawson et al., 2018; Deeley, 2019; Dowden, 2013; Small & Attree, 2016), Smits et al. (2008) asserted that clear and specific feedback may not always lead to improvement in learning. Elements of 'scaffolding feedback' and 'facilitative feedback' involve hints and clues (Finn & Metcalfe, 2010; Straub, 1996). It was found that hints or clues may be more effective for students' proactive engagement in finding the answer themselves (Van der Kleij & Lipnevich, 2021). Especially during a problem solving process, many students preferred to have some time to find out the answer or receive some clues after an inappropriate response before requesting the correct answer (Yoshida, 2008; Kim et al., 2021).

As hinting is not an elaborated form of feedback, it is categorized into facilitative feedback to highlight its effectiveness. A hint could better elicit the correct answer in students, and therefore directly optimize learning in students.

Questioning enables students to monitor and restructure their understandings. Questions serve as powerful support in eliciting student comprehension. Teacher's questions could involve 1) asking for clarification and articulation of student's understanding, 2) open question to invite students' participation to share their thoughts and reflections, and 3) asking questions if anything was unclear or if they had understood so far.

③ Positive Feedback

Positive feedback is often a crucial contributor to elicit students' uptake of feedback because it influences students' self-esteem and motivation. Emotional support is a part of students' learning experiences (Steen-Utheim & Wittek, 2017). Various studies argued to consider student emotion when giving feedback (Fong et al., 2016; Pekrun et al.,

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2014) because positive feedback or encouragement is likely to increase the chance of student acceptance of teacher's feedback. Indeed students endorsed teacher's praise and encouraging comments in research investigating student perception about feedback (Dawson et al., 2018; Deeley, 2019; Dowden, 2013; Small & Attree, 2016). As feedback, in general, could come across sensitively to students, it is recommended to provide both positive feedback with feedback that point to changes in student work (Stern & Solomon, 2006).

Positive feedback is known to enhance student confidence (e.g., Eva et al., 2012) and self-efficacy (Bandura, 1977), which may lead students to use the feedback.

④ Interactive Feedback

An important way to persuade students to act on the feedback is by conducting interactive dialogue between the instructor and students. Classroom context is based on interaction between and among students which is the interaction between the student and the instructor, and the interaction of students with one another (Pianta, Hamre, & Allen, 2012). In the context of interaction, teachers could reformulate and help refine students' understanding (Mercer, 2004; Newman, 2017). The reformulation of the instructor is to retain the original meaning of student's statement, but the instructor could add new information to make the point clearer or/and paraphrasing it.

⑤ Immediate Feedback

Previous studies have generally agreed that immediate feedback was preferred to delayed feedback (Benassi et al., 2014; Bangert-Drowns et al., 1991; Fyfe et al., 2021; Golke et al., 2015; Kulik & Kulik, 1998). In the classroom context, immediate feedback is an important aspect because as soon as students' interest is diminished in the task, there would be less chance for students to utilize the feedback (Gibbs & Simpson, 2004; Nicol & Macfarlane-Dick, 2006). It was concluded that feedback should be given immediately as possible in order to provide the opportunity for students to consider and use the feedback. Haughney et al. (2020) stated that timing should fall within close proximity to the initial learning process or the assignment.

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2.6. Feedback Outcome

An important question seems to be what we actually see as effective in feedback. Researchers from behaviorists to cognitive scientists have emphasized feedback as a corrective role (e.g., Clariana, 1990; Kulhavy & Stock, 1989; Scheeler et al., 2012). To determine the outcome, feedback was considered to be effective, if the wrong response was corrected. Studies within this tradition have compared the outcomes before and after receiving feedback (e.g., Finn et al., 2018; Kulhavy & Stock, 1989; Van der Kleij et al., 2015). Thus, the feedback outcome has been dependent upon test results (whether it is correct or not) or/and summative assessment.

However, recent literature has mentioned students' discontent with the quality of feedback (Ferguson, 2011), and increasing attention has been given to student perception of the feedback and the ways of how students act upon it (Carless, 2006; Van der Kleij & Lipnevich, 2020). Carless (2006), for instance, proposed the term feedback literacy and explained that feedback encompasses aspects of student's ability to recognize, understand, and take action. This suggestion is closely related to Ramaprasad's (1983) statement that feedback outcome is fulfilled only when feedback is used, and not stored in the memory. Taken together, it is important to interpret feedback through the lens of the students and the external elements that influence their use of feedback, as recent educational research is increasingly drawing attention to students' active engagement in learning.

Hence, the view of feedback outcome has been transformed from teacher-centered into a more student-centered aspects, and the outcome depends on how teachers create the conditions for students so that they engage with feedback. Boud and Molloy (2013) stated that it is critical to know 'how' students create meaning of the received information about their performance, indicating that it is the usefulness of feedback that determine the feedback outcome, rather than the numerical grades. Furthermore, there are a variety of factors that make students use the feedback. Using feedback means to reflect on their work and to develop some effort to build the relationship with feedback.

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Feedback, if provided properly, can have a positive impact on students' academic achievements, self-regulated learning, and motivation.

2.6.1. Academic Achievement

Understanding diverse effective feedback types and seeking appropriate approach may support the feedback outcome. The impact of feedback on student academic achievement resulting in significant improvement in learning is well documented in the literature (Kluger & DeNisi, 1996; Shute, 2008). Large amount of research has shown that feedback has positive and varied influences on learning (e.g., Azevedo & Bernard, 1995; Bangert-Drowns et al., 1991; Lipnevich & Smith, 2018; Kluger & DeNisi, 1996, Shute, 2008; Wiszniewski, 2020). Kluger and DeNisi (1996) conducted an extensive review on the effect of feedback based on 131 studies, and the results revealed an average effect of 0.38. The authors noted that one third of the feedback intervention was negatively related to performance. The most recent meta-analysis by Wisnzniewski (2020) was based on 435 studies and reported an average effect size of 0.48 on student learning. It was found that feedback had a bigger effect on cognitive and physical skills outcomes than on motivational and behavioral skills outcomes. However, the authors mentioned that only few studies of behavioral outcomes were available and considered, which may have led to inconsistency in effect sizes. However, students in studies investigating student perceptions of effective feedback (e.g., Dawson et al., 2019) often seem to emphasize the impact of feedback on their motivational and behavioral levels, because students often express their experiences of feedback in relation to motivations that, in turn, lead them to either use or reject the feedback they receive.

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2.6.2. Self-Regulated Learning

As the educational focus is shifting toward student-centered learning, feedback that promotes students' self-regulation skills is becoming increasingly important (Nicol & Macfarlane-Dick, 2006). The concept of self-regulated learning refers to how students manage their own learning process (Zimmermann, 2001). Students with effective self-regulation skills are more capable of taking responsibility for their own learning than others, managing their emotional influences, and coping by means of effective strategies. According to Zimmerman (1990), self-regulated learning is a process that assists students in taking control of their metacognition, behavior, and motivation for learning. The components of self-regulated learning are, however, distinguished differently by scholars. Initially, the term metacognitive control included planning, self-monitoring, modifying the cognition, and self-evaluating (Zimmerman, 1990; Zimmerman & Pons, 1988; Weinstein, Schulte, & Palmer, 1987). Some researchers have now included cognitive control, which involves strategies for learning, remembering, and understanding the material (Pintrich & Van de Groot, 1990). Behavioral control subjects to the management of time and effort for learning (Schunk, 2005). Time and effort include, for instance, constructing study schedules and persistent engagement in class. Lastly, Zimmerman (2000) described that the term *motivational control* consists of self-efficacy and interest (Vollmeyer & Rheinberg, 2006). Students with high motivational control show effort and persistence during learning (Zimmerman, 1990).

Taken together, it is well established in the literature that self-regulation is significantly associated with student achievement (Beishuizen & Steffens, 2011; Richardson, Abraham, & Bond, 2012; van de Boom, Paas, & Merrienboer, 2007; Zimmerman, 2008).

A number of studies have confirmed that feedback acts as a catalyst for self-regulatory skills (Butler & Winne, 1995; Nicol & Macfarlane, 2006). Brookhart (2017) stated that feedback is essential to students' self-regulation because it helps them to self-monitor and reflect on their own performances. While students monitor their learning process, internal feedback is generated (Butler & Winne, 1995) to determine whether the management of knowledge and strategies is needed. Thus, when noticing

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the difference between present state and goals, the student may strive to take action on his/her meta-cognitive, behavioral, or/and motivational processes by using external feedback (e.g., feedback from teachers).

In sum, students who act on feedback are considered self-regulated because they take the responsibility for their learning processes by reflecting on their performance and making adjustments when required (Zimmerman, 2008). However, the domain knowledge, strategy knowledge, tactics, and motivations may differ in each individual. Thus this may result in triggering different levels of self-regulated behaviors (Winne, 1996). Butler and Winne (1995) found that students with higher self-regulation skills use feedback more effectively than students with lower self-regulation skills. Agreeing with this statement, Boekaerts (1999) further noted that students with lower self-regulation skills tend to rely on external feedback to complete each task.

Several researchers have pointed out that students can develop the ability to self-regulate their learning by feedback strategies (Nicol & Macfarlane, 2006; Winstone et al., 2017; Zimmerman & Schunk, 2001). Even students with lower abilities are capable of becoming self-regulated learners (as cited in Nicol & Macfarlane-Dick, 2006). Hence, provision of feedback in an effective way has been investigated to enhance their capacity to self-regulate learning. Instruction guided by feedback is vital in that it guides students to gain awareness and strategies of their learning to reach their goals.

Nicol and Macfarlane-Dick (2006) established a model of good feedback practice by reviewing the feedback literature on how students become self-regulated learners. Seven principles for good feedback practice were suggested as follows:

(1) helps clarify what good performance is
(2) facilitates the development of self-assessment and reflection in learning
(3) delivers high-quality information to students about their learning
(4) encourages teacher and peer dialogue around learning
(5) encourages positive motivational beliefs and self-esteem
(6) provides opportunities to close the gap between current and desired performance
(7) provides information to teachers that can be used to help shape teaching

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The seven principles provide a guide for teachers to promote students' active role to seek, interpret and use the feedback for closing the gap between the present state and future goals. Several scholars have integrated these seven guidelines in order to create a good feedback practice (e.g., Boud & Molloy, 2013; Yeatman & Hewitt, 2020) that promotes self-regulated learning in students.

2.6.3. Motivation

Feedback is found to influence student motivation, which, in turn, has an impact on the performance (Vollmeyer & Rheinberg, 2005). The study of Iterbeke et al. (2021) revealed that elaborated feedback led to lower motivation states of students and suggested that overly detailed feedback was possibly perceived as 'excessive', thereby decreasing their motivation. Thus, the content of feedback may be less linked to the motivational aspects. As feedback is considered as a source of information that is provided for improvement in task (Wisniewski et al., 2020), students may have felt the feedback as controlling which might have caused in decrease of motivation. Straub (1996) noted that specific feedback may lead students to become passive as it may reduce the perception of autonomy support.

Prior studies showed that students receiving immediate feedback had higher intrinsic motivation to complete a task (e.g., Lin & Huang, 2018; Ryan & Deci, 2000). This can be reasoned to the fact that students possibly have the opportunity to modify their tasks.

From the perspectives of social constructivism, feedback should include respectful and honest comments to promote motivation (Li et al., 2010). Dawson et al. (2019) explored what students saw in feedback as effective, and revealed that feedback including encouragement and acknowledgement would motivate and lead to enhancement in motivation to improve their work.

Situations that provide negative feedback referring to failure are likely to generate a feeling of incompetence that in turn decreases the motivation for learning (Ilgen &

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Davis, 2000; Koka & Hein, 2003). However, not all negative feedback are detrimental to intrinsic motivation. Negative feedback containing messages of unsatisfactory performance could ultimately lead to increase in student motivation (Fong et al., 2018), if it is not perceived as destructive including sarcastic tone and threats (Harolds, 2013).

To sum up, the importance of students' acceptance of feedback has been well documented in prior research (Bangert-Drowns et al., 1991), and the factors that drive to successful feedback outcome are linked to self-regulated learning, as feedback is an inherent catalyst for self-regulation (Butler & Winne, 1995). The cognitive, metacognitive, behavioral, and motivational strategies cover the self-regulated learning in students which present an overview of how feedback may influence the outcome in learning.

2.7. Summary of 'Feedback Outcome'

Scholars suggest to implement feedback to promote self-regulated learning (Nicole & Macfarlane, 2006) because students need feedback about their learning to become aware of their strengths and weaknesses (Pintrich, 1995).

In order to understand how effective feedback contribute to student learning, a summary of the feedback outcomes are presented in <Table 6>.

<Table 6> Summary of 'feedback outcome'

Category	Construct	Examples	Literature
Feedback Outcome	Cognitive strategy	understanding the learning objectives and concepts/integration of the learning material/understanding of the goal and areas to be improved/recall of the learning material	• Dawson et al. (2019) • Nicol & Macfarlane-Dick (2006) • Zusho et al. (2003)
	Metacognitive strategy	evaluating understanding/ evaluating effort and strategies used on	• Hattie & Timperley

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Category	Construct	Examples	Literature
		tasks/self-reflection/monitoring	(2007) • Craig et al. (2020)
	Behavioral strategy	enhancement of participation in class/commitment into the task	• Hattie & Timperley (2007)
		asking for help to the teacher/asking questions in class	• Ryan & Pintrich, (1997)
	Motivational strategy	enthusiasm for learning and class/willingness to work harder/enjoying the class	• Zimmerman & Pons (1988)
		confidence in skills and abilities to do well	

① **Cognitive Strategy**

Students receive feedback from teachers on their understanding to take the next step to improve their performance (Molin et al., 2021). Research on self-regulation points to types of knowledge that are 1) domain knowledge, task knowledge, strategy knowledge, and motivational beliefs (Mory, 2004). As the domain knowledge increases, students acquire, use and transfer cognitive strategies (Perkins & Salmon, 1989). The cognitive strategy involves the overall understanding of the learning objectives and using or integrating the learning material into the task. According to Li and De Luca's (2014) systematic review, students desired a feedback that was applicable for further improvement. For instance, Dawson et al. (2019) stated that students viewed feedback as effective when it provided informations of what needed to be improved. Thus, acquiring knowledge for learning, such as understanding the learning material and pointing towards areas to be improved, can be sorted into the cognitive strategy that require surface level of processing the information (Zusho et al., 2003).

A number of researchers have studied the effects of timing and the content of the feedback to test the retention of the students (e.g., Butler et al., 2007; Kulik & Kulik,

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1988; Metcalfe et al., 2009; Van der Klij et al., 2015). For some scholars, delayed feedback were optimal for knowledge retention (e.g., Mullet at al., 2014). However, studies exploring students' perceptions of effective feedback suggested that it should involve advices that they could use for improvement of their future assignments (e.g., Carless, 2006; Malecka, Boud, & Carless, 2020) which is to be interpreted that students were willing to recall the feedback they received.

② Metacognitive Strategy

Metacognitive strategy involves evaluating one's understanding, as well as evaluating one's effort and strategies used in the task (Hattie & Timperley, 2007). The metacognitive strategy, which is also an ability to apply the learned knowledge to problem solving tasks, is known to increase with maturation (Alexander, Carr, & Schwanenflugel, 1995; Flavell, 1987), but an appropriate feedback can facilitate the metacognition. Students with higher metacognitive abilities take more advantage of the learning environment (Molin et al., 2021). Butler and Winne (1995) accounted that external feedback may lead students to be more aware of their performance with self-reflection, and it was revealed in prior studies that facilitative feedback providing cues and hints promoted metacognition in students (e.g., Kramarski & Zeichner, 2001).

③ Behavioral Strategy

According to Hattie and Timperley (2007), it is important to note that positive feedback directing to one's effort and the task can have an impact on student engagement to the task.

Help-seeking is one aspect of the behavioral strategy in self-regulated learning (Karbenick & Berger, 2013). If students encounter problems which they cannot solve on their own, they may need to seek help from teachers. Help-seeking behavior has been found to be related to engagement and motivation (Ryan & Pintrich, 1997). Thus, it can be assumed that feedback-seeking behavior is one of the key self-regulation tactics in the literature (Hattie & Timperley, 2007).

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④ **Motivational strategy**

An important aspect of self-regulated learning is that motivation and learning cannot be fully understood apart from each other (Zimmerman, 1990). It is assumable that if a student is not motivated, there is a high possibility that all the other strategies (i.e., cognitive and metacognitive strategy) will not be processed by students. Consistent with the statement, Nicol & Macfarlane-Dick (2006) suggested that motivation and self-esteem are essential for student learning and demonstrated in seven principles of feedback practice, to encourage positive motivational beliefs and self-esteem.

One positive motivational belief that promotes self-regulated learning is self-efficacy about the learning which is a positive judgement of one's capability to do a task (Pintrich, 1995). Previous research has shown that positive feedback increases self-efficacy (e.g., Beattie et al., 2016; Pfeifer et al., 2020), and self-efficacy increases the possibility of the investment of effort (Bandura, 1997). Thus, self-efficacy may be one of the most essential variable that needs to be facilitated for an effective learning, and instructors need to be aware of how their feedback has an impact on student motivational strategy, such as the self-efficacy.

2.8. Factors that influence Feedback

It has been mentioned in the prior literature (e.g., Huber & Seidel, 2018; Narciss et al., 2014) that not all students are equally receptive to feedback. Narciss et al. (2014) stated that students may differ from each other, as for instance in motivational states such as self-efficacy (Caffarella & Barnett, 2000; Ekholm et al., 2015) and goal-orientation (Butler, 1993; VandeWalle & Cummings, 1997; Shin, Lee, & Seo, 2017). Thus, feedback may be processed differently by each student which could in turn vary in the impact on feedback outcome.

Furthermore, a positive and supportive instructor-student relationship helps to facilitate the cognitive and affective development in student learning and it is one of the most important factors influencing the quality of higher education (Kim, 2016). When instructors respect and support their students, there is a higher possibility that the trust

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towards instructor is likely to be enhanced which possibly lead students to accept the feedback they receive.

Increasing studies (e.g., Carless et al., 2020; Fyfe et al., 2021) are investigating effective feedback types across a variety of disciplines that aims to find feedback practices in accordance with the specific contexts.

The following discusses factors that may influence the outcomes when receiving feedback.

2.8.1. Student Characteristics

Educational teachers interact with students who demonstrate a wide variety of characteristics such as self-efficacy (Handley et al., 2011; Sherf & Morrison, 2020) and goal-orientation (Winstone, Hepper, & Nash, 2021). According to Bandura (1996), self-efficacy is a primary source of influence on motivation, and it is associated with learner's choice of how much effort and persistence will be spent on a task. Some students with high self-efficacy may perceive feedback as an opportunity for further development while others with low self-efficacy may be discouraged to accept the feedback. In fact, feedback seeking behavior is likely to be higher when self-efficacy is high (Ashford et al., 2003). Some scholars theorized that learners with high self-efficacy might be more motivated to persist and engage with feedback (Handley et al., 2011; Kluger & DeNisi, 1996). Ekholm et al. (2015) investigated writing self-efficacy with 115 undergraduate students enrolled in education and english courses, and found that students' perceptions of the feedback partially mediated self-efficacy in writing. Thus, students who perceived the feedback as positive, tended to have higher self-efficacy. Findings from prior research (e.g., Caffarella & Barnett, 2000; Ekholm et al., 2015) implied that teachers' should invest an effort for students to perceive feedback as helpful for their learning.

Studies suggest that learning motivation, such as goal orientation of individuals influences the behavior of feedback seeking (VandeWalle & Cummings, 1997; Gong et al., 2014). Goal orientation refers to individual's reasons to engage in achievement situations (Dweck, 1986; Dweck & Leggett, 1988). Two broad classes are identified in

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defining the goals that individuals pursue (VandeWalle, 2003) that are the mastery goal and performance goal. Both mastery and performance goals are divided into approaching motives and avoidance motives (Winstone et al., 2021). Mastery and performance goal orientations refer to two distinctive patterns of how one interprets and responds to achievement situations (VandeWalle, 2003). An individual with a mastery goal orientation, there is a possibility to see feedback as useful for learning than one with performance goal orientation, viewing feedback as a judgement about oneself (Park & Sohn, 2020). Thus, one with high performance goal orientation may perceive feedback as a threat to the self-esteem.

Taken together, students' levels should be taken into consideration when providing feedback (Narciss et al., 2014). For teachers, knowledge of student self-efficacy or/and goal orientation is vital. The need to explore student characteristics is increasingly important in that it helps teachers to identify which feedback should be provided (Narciss et al., 2014) suited to each individual.

To sum up, there are differential effects of various characteristics of feedback, and it seems to be related under particular individual contexts. Furthermore, students' affective and motivational characteristics seem to be most related to the feedback valence, which are defined as positive and negative feedback in the literature (e.g., Kluger & DeNisi, 1996).

2.8.2. Instructor-Student Relationship

Several studies highlighted the relational aspects and suggested to explore the embedded relational connections during the feedback process (e.g., Carless, 2012; Carless, 2019; Dowden et al., 2013; Kim, 2005; Lee & Schallert, 2008; Pokorny & Pickford, 2010) because if feedback is the driver for student learning, the drives are partly reinforced by instructor-student relationship in which instructors play a vital role in creating interpersonal relationship. As Kulhavy (1977) has earlier noted, feedback itself may not be powerful to initiate any further action by a student. Thus, it has to

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be considered that feedback per se is not the sole cause of a successful learning outcome. For instance, Wubbels and Levy (1993) accounted that instructor-student relationships were related to students' perceptions of the classroom environment. In the classroom context, positive experience about the relationships with their instructors coincided with the perception of the classroom environment.

Taken together, the instructor-student relationship plays a key role in the quality of instruction in higher education. It seems that it similarly applies to the perception of the feedback process in students. Poulos and Mahony (2008) acknowledged that feedback was not an independent feature, but it was rather related with student perceptions of the instructors. Several scholars stated that a trusting relationship between instructor and student needs to be established, for feedback to be accepted by students (Carless & Boud, 2018; Kim, 2005; Lee & Schallert, 2008). Kim (2005) investigated instructor-student interactions in online assignment process and found that although students acknowledged the value of feedback on their tasks, students' trust played a decisive role on how they perceived the feedback. Consistent with the findings, Carless (2012) suggested that "Trusting virtues such as empathy, tact and a genuine willingness to listen are ways in which positive feedback messages can flourish and more critical ones be softened" (p. 90). Thus, feedback is influenced by the relationship between the instructor and student, and a supportive atmosphere seems to be essential for students to accept the feedback. The case study of Steen-Utheim and Wittek (2017) was conducted qualitatively using audio recordings of feedback dialogues, field notes, and classroom observations, with the findings that the instructor showed respect to students providing supportive comments ('I believe in you') that facilitated students' trust, encouraging their engagement with feedback. Despite the environment of higher education due to the limited time and space, feedback studies (e.g., Carless, 2019; Steen-Utheim & Wittek, 2017) emphasized the importance of interpersonal relationship between instructor-student relationship, and interactive feedback was found to promote the relationship between the instructor and students. If the feedback practice is a part of effective teaching, the aspects of teacher's beliefs, knowledge, behavior and the relationship with the student should all be taken into account to describe the qualities of a good teacher (Kim, 2005).

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2.8.3. Feedback across Disciplines

Feedback is situated within the various practices of disciplines (Carless et al., 2020). Literature has widely researched feedback in the following settings: education management (e.g., Ilies, Pater, & Judege, 2007), physical education (e.g., Lee, Keh, & Magill, 1993; Petranek, Bolter, & Bell, 2019), liberal arts (e.g., Schrand & Eliason, 2012), L1 and L2 classroom (e.g., Kim & Paek, 2016; Lee & Schallert, 2008), psychology (e.g., Cretu & Negovan, 2012; Moreno, 2004), science (e.g., Brown & Glover, 2006; Fernández-Toro, Truman, & Walker, 2013), teacher education (e.g., Dowden, 2013), and medical education (e.g., Archer, 2010). Instructors are often found to fail to use general feedback in their practice that suits to their disciplines (Carless et al., 2020) because the differences of effective feedback across various disciplines have not been widely studied yet. Fernández-Toro et al. (2013) analyzed 4,000 written feedback comments of teachers from language and technology disciplines. The result revealed that 41% of the comments from teachers in technology classes referred to the content and 32% were motivational comments. Written feedback from language class teachers showed that 75% of the teachers referred to skills development and 16% of the comments were motivational. Comparing the types of comments from these two teaching disciplines, one can see that corrective feedback focusing on immediate improvement in fluency, speaking, and writing is preferred by the language sector. whereas the technology sector focuses more on illustrating common misconceptions of the learning content with suggestions for future improvement.

Carless et al.'s (2020) qualitative study examined how feedback was provided in four different academic subjects: architecture, education, engineering, and medicine. The teacher of the architecture class expressed that feedback was most effective as a teacher-student or student-student dialogue throughout the work in progress. Feedback was less about what was right or wrong and more about developing a discussion whereby better answers and new ideas could be generated. Students of the education class welcomed feedback comments on outlines or drafts that they could use to improve their grades, that is, feedback was valued if it was usable for future assignments. Interviews with engineering students revealed that they received only their

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grades without particular feedback. Thus, feedback was provided less in the engineering culture. Students also seemed to prefer peer learning over teacher feedback as peers were more approachable for receiving feedback than teachers. In the case of medicine, problem-based learning tutorials were common activities and served as the only feature of the medical curriculum where feedback was provided. It was a common process for students to write reflective essays about their learning after receiving evaluative feedback through student e-portfolios. Medical students generally valued personalized feedback that was specific and guiding, which highlighted alternative ways of performing a medical procedure.

Therefore, different academic disciplines used different feedback methods. Even though there is this distinction, there is an underlying commonality that students not only appreciate but also pursue interactions with their teachers. Feedback-seeking behavior clearly resides in students, and the interactional feedback process is seen as vital throughout the academic subjects.

2.9. Measurement of Feedback

Survey method is a frequently used approach in the social sciences to investigate elements of psychological variables (Roberts, 1999). According to the recent review of Van der Kleij and Lipnevich (2021), 50% of studies applied surveys to investigate student perceptions of feedback. However, there is a lack of the validated instrument for measuring effective feedback in higher education to find reliable results. Furthermore, none of the scales covered all characteristics and aspects of feedback.

2.9.1. Measurement Tools of Feedback

To date, a number of authors have developed feedback instruments (e.g., Marrs, 2013; Jellicoe & Forsythe, 2019; Kim & Sohn, 2021; King, Schrodt, & Weisel, 2009;

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Linderbaum & Levy, 2010; Park & Sohn, 2019). This section focuses on reviewing both foreign and national (Korean) scales related to feedback. As stated above, there are only few instances of validated feedback instruments available, and a large amount of the instruments emphasize the usefulness of feedback, the feedback quality, and behavioral and motivational effects of feedback. Recent developments of scales are aligning with theories of self-regulated learning (e.g., Jellicoe & Forsythe, 2019; Park & Sohn, 2019). <Table 7> below presents a list of variables and item examples of studies on scale development and validation.

<Table 7> Foreign feedback measurement tool

Type of information	Summary of the instrument development	
Author(s)	Jellicoe & Forsythe (2019)	
Variables assessed/ Item example	(1) Credible source challenge	"The staff who assessed me are outstanding in their capacity to gain my confidence."
	(2) Acceptance from feedback	"I believe the feedback I received depicts me accurately."
	(3) Motivational intention	"I am motivated to develop myself in the direction of the feedback I received."
	(4) Behavioral changes and developmental actions	"Following feedback I have searched for developmental activities in line with competencies described during the feedback"
	(5) Awareness from feedback	"I am more aware of the strengths that I can draw on from my studies."
Age/format	psychology undergraduate students/ 27-item, 6 point Likert scale	
Reliability	.75 ~ .90 Cronbach alphas for items within each factor	
Validity	(a) As a total, the factors cumulatively explained 49% of the variance in the model. (b) Latent variable structural equation modeling shows five latent variables as a good fit (CFI= .934)	

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Type of information	Summary of the instrument development	
Author(s)	Marrs (2016)	
Variables assessed/ Item example	(1) Writing improvement	"I look forward to feedback on my writing."
	(2) Positive affect	"Feedback makes me feel like I am a good writer."
	(3) Negative affect	"Feedback on my writing makes me feel like I am a bad writer."
	(4) Feedback message	"Feedback is very specific."
Age/format	high school students/ 20-item, 7 point Likert scale(initially 70 items were reduced to 31 items in final; subsequent analysis reduced to 20 items)	
Reliability	(a) .63 ~ .94 Cronbach alphas for items within each factor (b) .17 ~ .57 inter-item correlations for items within each factor	
Validity	(1) Exploratory factor analysis (EFA) yielded a four-factor structure that accounted for 55% of the variance.	
Author(s)	Linderbaum & Levy (2010)	
Variables assessed/ Item example	Utility	"To develop my skills at work, i rely on feedback."
	Social awareness	"Using feedback, I am more aware of what people think of me."
	Feedback self-efficacy	"I know that I can handle the feedback that I receive."
	Accountability	"I hold myself accountable to respond to feedback appropriately."
Age/format	undergraduate students/ 20 item, 5 point Likert scale	
Reliability	(a) .73 ~ .88 Cronbach alphas for items within each factor, overall alpha = .91 (b) .11 ~ .50 inter-item correlations for items within each factor	
Validity	(1) Content validity: subject matter experts provided feedback on the clarity and comprehensiveness of dimension definitions of feedback, and the clarity and readability of the items (2) Exploratory factor analysis (EFA) yielded a four-factor solution (3) Confirmatory factor analysis (CFA): Second-order factor model (X^2 = 429.2, df = 166, standardized root mean square residual = .08, root mean square error of	

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Type of information	Summary of the instrument development	
	approximation = .08, comparative fit index = .89, Tucker-Lewis index = .97) was found as a good fit model	
Author(s)	King, Schrodt, & Weisel (2009)	
Variables assessed/ Item example	Utility	"I think feedback from teachers is vitally important in improving my performance."
	Sensitivity	"My feelings can be easily hurt by corrective feedback from a teacher."
	Confidentiality	"I do not like for others to hear what feedback I am receiving."
	Retention	"I can't remember what teachers want me to do when they provide feedback."
Age/format	undergraduate students from a suburban college/ 33-item, 5 point Likert scale (initial 180 items were reduced to 33 items; subsequent analysis reduced to 27 items)	
Reliability	.69 ~ .88 Cronbach alphas for items within each factor	
Validity	(1) Confirmatory factor analysis (CFA): four factor model (X^2 =594.79, p<0.001, NNFI=.94, CFI=.95, RMSEA=.060, with 90% confidence interval =0.053 – 0.067) was most appropriate model fit (2) R^2= .08 ~ .31 of Concurrent validity measures	
Author(s)	Lizzio & Wilson (2008)	
Variables assessed/ Item example	Development	"Comments helped me focus on areas I could improve."
	Encouragement	"Acknowledged my good points or ideas."
	Fairness	"Gave feedback that I could not understand."
Age/format	undergraduate/graduate students (age range 17-51 years)/ 15-item, 7 point Likert scale (initial 24 items were reduced to 15 item set)	
Reliability	(1) Inter-rater agreement of 0.94 (2) student check for clarity of expression (3) .21 ~ .60 inter-item correlations for items within each factor (4) .91 overall Cronbach's alpha	
Validity	(1) Exploratory factor analysis (EFA) yielded a three-factor structure that accounted for 46.30% of the variance.	

Jellicoe and Forsythe (2019) completed a study which tested the perspectives of

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feedback based on two groups of psychology undergraduate students. The authors validated a measurement tool derived from an occupational domain that was implemented into higher education. The measurement assessed message valence, source credibility, feedback interventions that lead to challenge, feedback acceptance, awareness, motivation, and behavioral change. Items were used from an existing measure of the research conducted by Boudrias et al. (2014) which was originally developed within an occupational setting. The authors modified the measurement for undergraduate students majoring psychology.

Findings from this study are significant in that it highlights the importance of enhancing learner awareness of feedback because it relates directly to students' motivational intentions. The instrument is valuable in that it aligns with the theories of self-regulated learning so that it could help to identify students with lower acceptance, awareness, motivation, and ultimately, lower chance of behavioral change. However, factors for self-regulated learning in this study tended to focus more towards the motivational aspects and less on the cognitive aspects in regards to learning. Thus, this instrument did not cover all dimensions of self-regulated learning. Butler and Winne (1995) stated that "feedback is generated by the monitoring process...We hypothesize that more effective learners develop idiosyncratic cognitive routines for creating internal feedback while they are engaged with academic tasks." (p. 245). It is important not to preconclude feedback as effective because it was accepted by the student. There is still a need to emphasize the procedure of student engagement in active cognitive and metacognitive processing during the task to develop deeper understanding in the learning material.

Using a more task-specific approach in the educational context, Marrs (2016) developed the 'Student Perceptions of Writing Feedback Scale (PoWF)' with 20 items measuring perceived feedback effectiveness on written work. The author implemented a self-report questionnaire (derived from the literature). The initial pool of 70 items was constructed that asked (1) how students view feedback, (2) what their expectations of feedback are, (3) students' experiences with feedback, (4) how students used and/or valued feedback, and (5) affect on receiving feedback. Four initial dimensions of student responses emerged as follows: (1) views/expectations of feedback, (2)

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experiences with feedback, (3) usefulness/value of feedback, and (4) affect/emotions associated with feedback. The PoWF scale derived 20 items comprising four sub-scales which were: (1) writing improvement (feedback that serves for student improvement in writing), (2) positive affect (feedback that results in students' positive affect), (3) negative affect (feedback that results in students' negative affect), and (4) feedback message (feedback content).

Unfortunately, the study of Marrs (2016) did not present any specific steps and process of the content validity, which led to doubt if the items were appropriately targeted to the construct and objectives intended to measure. Furthermore, the four sub-scales yielded a Cronbach's alpha of .63 to .94. The fourth factor which was the feedback message (Cronbach's alpha= .63) showed a questionable reliability. The author did not conduct confirmatory factor analysis (CFA), which is needed to validate the instrument by verifying the factor structure of the observed variables (Joseph et al., 2012). Thus, the study did not conduct the required validation process for instrument development.

Linderbaum and Levy (2010) developed and validated the 'Feedback Orientation Scale (FOS)'. The authors explain that several drives promote the utilization of feedback (Cachia et al., 2021). It was suggested that feedback orientation helps to understand individual's differences in reacting, interpreting, and using the feedback. Drawing on the extant literature, theoretical, and empirical support, the authors derived four dimensions that are as follows, (1) utility (a belief that feedback is useful in achieving goals or desired outcomes), (2) accountability (feeling the responsible to react on feedback), (3) social awareness (using the feedback information with sensitivity to others), and (4) feedback self-efficacy (perceived competence to interpret and respond to feedback). The FOS consisted of 20 items with 5 items in each dimensions. The results found evidence for reliability of the scale witch Cronbach's alpha of .91. The validity of the scale was assured through two pilot studies using samples of 300 undergraduate students and 267 working adults. According to Linderbaum and Levy (2010), those who had high feedback orientation and who perceived high value in feedback, tended to seek out for feedback and focus on their growth. In sum, the FOS is valuable in that it measures the extent to how feedback is perceived and used by the person who

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receives it. However, it has to be noted that this scale has been administered mainly in organizational settings.

To better understand how students perceive teacher feedback, King, Schrodt, and Weisel (2009) uncovered four perceptual dimensions for 'Feedback Orientation Scale (IFOS)' that was based on the existing feedback literature. In study 1, an initial item pool of over 180 items was developed. 212 undergraduate students from a suburban community college completed the pilot test through an online questionnaire. In final, four-factor solution was retained with 33 items. The identified factors were labeled as: (1) feedback utility (reflecting students' perceptions that feedback is useful), (2) feedback sensitivity (reflecting students' emotional sensitivity towards feedback), (3) feedback confidentiality (reflecting students preference of feedback in a private manner, rather than public), and (4) feedback retention (reflecting the degree to which students retain or fail to retain feedback from teachers). The estimates of internal reliability for the four factors revealed acceptable Cronbach's alpha coefficients ranging from 0.69 to 0.88.

To confirm the four-factor solutions for IFOS, the King et al. (2009) conducted a confirmatory factor analysis (CFA) and 27-items were confirmed. The authors used appropriate analytical techniques for the construct of a reliable measurement tool to explore students' perceptions of receiving teacher feedback. However, the term 'corrective feedback' used in the items were ambiguous, as there are various ranges of corrective feedback types in the literature. For instance, the item "Corrective feedback hurts my feelings" does not specify which characteristics of feedback it refers to. Thus, it is assumable that there are various corrective feedback types with different impacts on the four dimensions (utility, sensitivity, confidentiality, and retention). Lastly, each student may tend to interpret the 'corrective feedback' as stated in the study differently which would lead one to question about the comprehensiveness of the characteristics of feedback.

Lizzio and Wilson (2008) used a mixed method approach by conducting two studies. For study 1, the authors created a questionnaire to examine undergraduate students' perceptions of written assignment feedback. 57 psychology, law, and art students participated in qualitative study and were asked to (1) recall the number and type of

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assessments undertaken during their degree, and (2) describe the types of written feedback they had received as effective, useful, or helpful as well as those they found ineffective. A total of 238 written comments were gathered and a coding scheme of 13 categories were produced which showed an inter-rater agreement of 0.94. The result revealed that students preferred feedback that supported transferable learning, teachers' thorough interest in student work, and encouraging feedback with a considerate tone. Lastly, students also emphasized the importance of fairness in feedback, such as providing a justification of a grade.

Study 2 investigated the underlying structure of students' perceptions about feedback by constructing the Assignment Feedback Questionnaire (AFQ) with a pool of 24 items. The items asked about the quality of written feedbacks they received on their assignments, essays, and lab reports etc. using a 7-point Likert scale. The three-item scale demonstrated a sufficient internal consistency with Cronbach's alpha of 0.91. The factors derived from the factor analysis were labeled as 'Developmental Feedback (scaffolding function which enables the recipient to develop beyond current level of performance)', 'Encouraging Feedback (aspects of feedback related to the motivational state)', and 'Fair Feedback (perceived fairness of the feedback)'. The limitation of the research is that the sample of 57 and the limited range of academic subjects are questionable to ensure data saturation. Moreover, prior studies have revealed that feedback is differently provided and perceived in subjects of nature/engineering science (Carless et al., 2020; Fernández-Toro et al, 2013). Due to the absent data of the nature/engineering science, the presented result may yield limited findings. Thus, the data sampling should incorporate a wide diversity of academic disciplines.

2.9.2. National (Korean) Measurement Tool of Feedback

Apart from a considerable lack of feedback measurement instrument in Korea, the 'Feedback Environment Scale' (Kim & Sohn, 2021) and the 'Feedback Literacy Scale' (Park & Sohn, 2019) are two of the few existing tools that assess the feedback

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outcome. Kim and Sohn (2021) reported that in order for feedback to be effective, a positive interaction between teacher and student is essential, and feedback outcome may vary according to the situational context. The authors translated and validated the Feedback Environment Scale with 31 items, originally developed by Steelman et al. (2004). Through the item analysis including the content reliability test, the instrument was adjusted and piloted to 145 elementary, middle, and high school students in Korea. 24 items were reduced to 23 items for the finalized FES scale, and these items were administered to 673 students from 9 different schools.

Some sample items that the authors provided were as follows. First, “I have trust in the feedback of my teacher.” item was intended to index students’ trust towards the teacher, whereas “The teacher provides useful feedback.” item was used to gauge student perceptions of the feedback quality. The item “My teacher provides feedback in a proficient way” was directed to the variable feedback delivery, whereas “I have a conversation with my teacher almost every day.” is used to determine teacher availability. Lastly, “My teacher is always available when I have questions about assignments and study.” focuses on the dimension pursuit of feedback. The limitation of this study is that elementary students were included as participants who have different level of understandings of the items as compared to high school students. This possibly led to a low reliability in the dimension of pursuit of feedback (Cronbach’s alpha = .65).

Park and Sohn (2019) emphasized on learner's uptake of feedback and have worked on the development of the Feedback Literacy Scale (FLS) for middle school students. The instrument captures the construct of ‘feed up’, ‘feedback’, and ‘feedforward’ describing the dimension of use of feedback, while the dimension Feedback attitude relates to the ‘cognitive’, ‘emotional’, and ‘behavioral’ domains. This measurement tool involves a comprehensive aspects of the outcomes of feedback in relation to the self-regulated learning. However, the limitation of the measurement tool is that it did not provide the characteristics of varying feedback from teachers, that is left unanswered about what feedback influenced the literacy and attitude of feedback in students. <Table 8> presents an overview of the national feedback instrument.

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<Table 8> National feedback measurement tool

Author(s) (Year)	Variables	Item example
Kim & Sohn (2021)	Trust towards the teacher	"I have trust in the feedback of my teacher."
	Feedback quality	"My teacher provides useful feedback."
	Feedback delivery	"My teacher provides feedback in a proficient way."
	Teacher availability	"My teacher is always available when I have questions about assignments and study."
Park & Sohn (2019)	Use of feedback	"I know on what criteria (high, medium, low, etc.) my learning is being evaluated." (feed up)
		"I can identify wrong answers or areas that I did not know about." (feedback)
		"I think of the learning strategy using the feedback." (feed forward).
	Feedback attitude	"When receiving feedback, I can identify areas where I need to invest more effort." (cognitive).
		"When receiving feedback, I feel that I will improve my learning." (emotional).
		"If I do not understand the feedback, I seek help from others." (behavioral)

2.9.3. Limitations of Existing Measures

Recognizing feedback as a help serving for improvement and the action necessary to take the next steps are vital to the self-regulated learning (Zimmerman, 2000; Panadero, 2017). However, existing measures of feedback often point towards the usefulness of the feedback which in turn makes the term of characteristics of effective feedback ambiguous. It is often not clear enough to identify what characteristics of feedback

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promote action in student, and how it motivates one to act in relation to self-regulated learning. This can be reasoned to that existing research approached generating items from prior literature instead of conducting an inductive approach, exploring students' experiences of feedback. For instance, an item stating that believing feedback as vitally important in improving performance does not reveal in what way it improved learning. The term 'usefulness' or 'utility' can be perceived differently by each student which in turn deludes or misleads the essence of feedback and that is when an additional qualitative approach is needed for gaining informative opinions of what effective feedback entails. There are factors that make students believe that the feedback is useful, not only for their motivation but also their self-regulated learning. Higher education is increasingly emphasizing the self-regulated learning strategies to achieve academic success. Therefore, in order to understand thoroughly the feedback process in the classroom context, there is a need to conduct both deductive and inductive approaches for the development of the measurement tool. This process would assure both the theoretical definition of the feedback construct and the incorporation of the undergraduate students' perspectives in understanding feedback outcome derived as the actual receiver for teachers to understand the feedback phenomena.

To date, there are only a small number of research developing and validating a measurement tool examining both the 'characteristics of effective feedback' and 'feedback outcome'. Measuring both aspects of feedback could elicit deeper insights into the feedback process and react accordingly to the need of students in higher education.

3. Methodology

This chapter discusses the procedures for development and validation of 'Effective Feedback' Instrument (EFI). The development procedure of the instrument is in accordance to <Table 9>. The procedure is largely divided into four phases.

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<Table 9> Development and validation procedure of EFI

	Purpose	Participants	Procedure	Product
Phase1	• Exploration of the 'characteristics of effective feedback' and 'feedback outcome' based on the literature review		• Review of the literature (deductive approach)	• Concepts of the constructs from deductive approach
Phase2	• Exploration of the 'characteristics of effective feedback' and 'feedback outcome' based on students' perspectives	• 230 undergraduate students of A university	• Open-ended survey (inductive approach) - Coding - Inter-rater reliability test	• Concepts of the constructs through inductive approach • Preliminary items for content validity
Phase3	• Validation of the constructs and preliminary items	• Content Validity through expert review • 6 experts - 3 experts of educational psychology and psychometrics - 3 experts of educational technology	• Expert review(2 rounds) - Modification of constructs and items • Item selection for 'characteristics of effective feedback' and 'feedback outcome'	• Content Validity - Validation through calculation of the panel rating (average score, CVR, and CVI) • 68 items for pilot test
Phase4	• Validation of the Instrument	• Pilot Test • 278 undergraduate students of B University • Main Test • 524 undergraduate students of A, B, C University	• Exploratory Factor Analysis • Reliability Test: Internal Consistency • Construct Validity • Convergent/Divergent Validity - Comparison between academic disciplines - Academic Self-Efficacy (10 items) - Learning Motivation (9 items) - Instructor-student Relationship (28 items) • Concurrent Validity - Formative Feedback Practice Scale (10 items) - Feedback Literacy Scale (10 items)	• Finalizing 36 items for the main test • Validation of the main test

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3.1. Research Design

The purpose of this study was to develop and validate an 'Effective Feedback' Instrument for higher education. Development of a measurement tool is one of the important research designs in social science (Boateng, Neilands, Frongillo, & Melgar-Quinonez, 2018). The main purpose is the assessment of validity in measuring an underlying construct (Clark & Watson, 2019). The approach to develop measurement tool is taken when the researcher aims to measure a phenomenon of interest but that cannot be directly assessed (DeVellis, 2017). Netemeyer et al. (2003) indicated that unobservable variables (e.g., perceptions, beliefs, emotions) are measured in scale development.

A research design is usually quantitative and/or qualitative. However, most researchers agree that mixed methods produce a more comprehensive understanding because the key informations stated by participants can enrich the quality of the research (Borg & Gall, 1989). There are deductive and inductive approaches for instrument development. Deductive approach is based on the theoretical definitions and conceptualization of construct of prior literature. The definition of the construct is then used as a guide for the construction of the items (Schwab, 1980). The advantage of the deductive approach is that it may help to ensure the content validity for the final scales (Swanson & Holton, p. 165).

The beginning stage of the instrument development is the generation of the item pool to assess the constructs. The primary objective of this study was to investigate the term 'characteristics of effective feedback' and 'feedback outcome'. A thorough literature review was undertaken in this study, to primarily determine the constructs of effective feedback and the outcomes.

Inductive approaches are used when uncertainty exists in defining the construct for item generation (Ford & Scandura, 2007). A qualitative approach is used to ask respondents to provide insights of what they perceive and feel about a certain phenomenon. The responses are classified into categories derived from content analysis

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based on the key words or themes (Hsieh & Shannon, 2005). Finally, constructs are derived which then build the basis to generate items. However, difficulty arises when using only inductive approach because item contents could result inconsistency in categorizing into concept. Morgado et al. (2017) suggested a combination of deductive and inductive approaches for an instrument development. Following the suggestion, this study additionally accepted the inductive approach through conducting an open-ended survey for the development of the EFI. Both the deductive and inductive approaches could assure the theoretical definition of the construct and to integrate more diverse perspectives to strengthen the validity of the measurement tool.

Content validity refers to the extent to which the items represent the constructs of the measurement tool (Rutherford-Hemming, 2015). This study conducted the content validation by receiving constructive feedback from experts about the quality of the constructs and the generated items. After removing and modifying the items suited to the suggestions of the experts, preliminary items were generated for the pilot test. Exploratory Factor Analysis (EFA) was conducted to explore the number of factors (Stapleton, 1997) and final selection of the items for the main test.

Additional effort must be paid to the validity and reliability of the final instrument (Ives, Olson, & Baroudi, 1983). When the instrument is developed well, it usually shows a high reliability and validity which support the use of the tool. Reliability is related to whether the instrument measures the construct in consistent and predicable ways (DeVellis, 2017). Thus, reliability is concerned with the question, if the results demonstrate the same results when repeating the measurement. Validity is concerned with the question of whether the initial item reflects what it intends to measure (Tavakol & Dennick, 2011).

Reliability of the final instrument of EFI was tested to test whether it provides stable and consistent result (Carminers & Zeller, 1979) measuring the same constructs. Construct validity was tested using Confirmatory Factor Analysis (CFA) and it was performed for the purpose of confirming the factor structures for ‘characteristics of effective feedback’ and ‘feedback outcome’. Convergent validity was conducted to investigate constructs that theoretically should relate, are in fact related (Öncel, 2014). Furthermore, the divergent validity was investigated to demonstrate that the constructs

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of EFI and other instrument are not correlated to a high degree (Whitley, 1996). As the last validity process, concurrent validation was conducted between EFI with existing feedback instrument that was sought to be related (Adams et al., 2014), in order to examine the degree of agreement between two instruments.

Taken together, this research attempted to conceptualize the 'characteristics of effective feedback' and the 'feedback outcome' through deductive and inductive approach for item generation of EFI, followed by content validity through expert panels. For construct validation, CFA was conducted, followed by the convergent, divergent, and concurrent validity.

3.2. Participants

In order to gather informative opinions of what effective feedback entails, the approach of open-ended questions was applied to explore the insights of university students about what types of feedback they perceived as effective and how it effected on their self-regulated learning. Open-ended questions ask respondents to write their thoughts in their own words (Fink, 2010), and the questions usually allow participants to provide descriptive and detailed answers, generating richer information about their opinion. Furthermore, they allow researchers to explore and/or reconfirm existing ideas and theories. Next, participant informations of the pilot test and main test are provided.

Roscoe (1975) recommended that a sample size of greater than 30 and less than 500 is suitable for studies. According to DeVellis (2012), 300 participants are considered as an adequate sample size, whereas Guadagnoli & Velicer (1988) accounted that a sample size of 150 is seen as sufficient for a factor analysis, if the item inter-correlations are reasonably strong. For determining an adequate sample size, a rule of thumb has been at least 10 participants for each scale item, with an ideal ratio of 10:1 (Nunally, 1978). However, there are other scholars that suggest sample sizes independent of the number of items, seeing a sample size of 200 to 300 as appropriate (e.g., Clark & Watson, 1995; Comrey & Lee, 1992). Considering to conduct the construct validity and

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concurrent validity, this research established a sampling size of 524 students.

The sampling procedure was designed to yield purposive samples representative of the population of the university in Gwangju and Jeolla province.

3.2.1. Open-Ended Survey

The data was based on the data of Kim et al's (2021) open-ended survey which was conducted by this researcher. A total of 238 second to fourth-year undergraduate students were recruited to participate in the study. The researcher considered to recruit students with some experiences with feedback they would have received upon their entry into the university and sought to exclude first year students. Efforts were made to survey a varied sample of participants with diverse majors enrolled in teaching subjects at B university located in the metropolitan area of Gwangju city. Participant characteristics are reported in <Table 10>. The gender distribution consisted of 78 male students (33.9%) and 152 female students (66.1%). 88(38.3%) students were majoring in Humanities and Social sciences, whereas 101 (43.9%) were from Natural science and Engineering majors. The number of students majoring Arts and Physical education were 41(17.8%). 115(50%) students were in the second year, 89(38.7%) students in the third, and 26 students (11.3%) in the fourth year.

<Table 10> Demographics of participants for the open-ended survey

unit: n(%)

Variable		Gender		Total
		Male	Female	
Major	Humanities/ Social science	22(25.0)	66(75.0)	88(38.3)
	Natural science/Engineering	47(46.5)	54(53.5)	101(43.9)
	Arts/Physical education	9(22.0)	32(78.0)	41(17.8)
Year	2nd	41(52.6)	74(48.7)	115(50.0)
	3rd	30(38.5)	59(38.8)	89(38.7)
	4th	7(9.0)	19(12.5)	26(11.3)
Total		78(33.9)	152(66.1)	230(100.0)

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3.2.2. Pilot Test

After the item generation and content validation, a convenient sample of undergraduate students was recruited. The pilot test of this research was conducted from 2nd till 5th of November 2021 on 291 undergraduate students enrolled in a private university based in Cholla Namdo. The sample characteristics are summarized in <Table 11>. The criteria for both pilot and main testing was that the survey being conducted after the mid-term exam so that the students had chances to receive some amount of feedback from teachers. 291 participants completed the questionnaire. Of the 291, 115(41.4%) were males and 163(58.6%) were females. 18(15.7%) male and 33(20.2%) female were majoring in Humanities and Social sciences, whereas 97(84.3%) and 129(79.1%) female were from the Natural science and Engineering. In total, 110 (39.6%) students were first year students, 94(33.8%) of the students were in the second year. 64(24.5%) consisted of third year students, and 6(2.2%) from the fourth year.

<Table 11> Demographics of participants for the pilot test

unit: n(%)

Variable		Gender		Total
		Male	Female	
Major	Humanities/ Social science	18(15.7)	33(20.2)	51(18.3)
	Natural science/Engineering	97(84.3)	129(79.1)	226(81.3)
	Arts/Physical education	0(0.0)	1(0.6)	1(0.4)
Year	1st	51(44.3)	59(36.2)	110(39.6)
	2nd	30(26.1)	64(39.3)	94(33.8)
	3rd	32(27.8)	36(22.1)	68(24.5)
	4th	2(1.7)	4(2.5)	6(2.2)
Total		115(41.4)	163(58.6)	278(100.0)

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3.2.3. Main Test

The sampling procedure was designed to yield purposive samples representative of the population of the university in Gwangju and Jeolla province. A total sample of 524 students agreed to participate on a voluntary basis for the main test. The main test was conducted from 6th till 12th of December 2021 on undergraduate students enrolled in a private university A and B based in Gwangju Province, and university C based in Jeolla Nam Do Province. The sample characteristics are summarized in <Table 12>. The gender distribution consisted of 267 male students (51%) and 257 female students (49.0%). 229(43.7%) students were majoring in Humanities and Social sciences, whereas 201 (38.4%) were from Natural science and Engineering majors. The number of students majoring Arts and Physical education were 94(17.9%). 53(10.1%) of the students were in the first year, 169(32.3%) in the second year, 205(39.1%) students in the third, and 86(16.4%) students in the fourth year. There were 6(2.2%) either in the fifth year or above.

<Table 12> Demographics of the participants for the main test

unit: n(%)

Variable		Gender		Total
		Male	Female	
Major	Humanities/ social science	71(26.6)	158(61.5)	229(43.7)
	Natural science/engineering	136(50.9)	65(25.3)	201(38.4)
	Arts/physical education	60(22.5)	34(13.2)	94(17.9)
Year	1st	33(12.4)	20(7.8)	53(10.1)
	2nd	83(31.5)	85(33.1)	169(32.3)
	3rd	112(41.9)	93(36.2)	205(39.1)
	4th	32(12.0)	54(21.0)	86(16.4)
	5th or above	6(2.2)	5(1.9)	11(2.1)
Total		267(100.0)	257(100.0)	524(100.0)

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3.3. Ethical Approval

An ethical committee approval was obtained by the Institutional Review Board (IRB) of Chosun University for the development and validation of the EFI, ensuring the protection of the rights and welfare of the participants.

Prior to the commencement of the data collection, students were provided with an explanation outlining the study. The rationale of the research was explained describing the development of the 'Effective Feedback' Instrument (EFI) for higher education. All students were informed about their anonymity and confidentiality, and students were told that they had the opportunity to withdraw from the research any time. The consent form is presented in <Appendix A>.

3.4. Procedure 1: Conceptualization of EFI

This section describes the procedure of the construct and preliminary item generation for EFI. The study took a deductive approach based on previous literature to convey constructs that encompass the 'characteristics of effective feedback' and 'feedback outcome. A thorough literature review was undertaken, in order to primarily determine the constructs of effective feedback and the outcomes which was performed from March till October 2019.

3.4.1. Open-ended Survey

In order to gather informative opinions of what effective feedback entails, the inductive approach was applied to explore the insights of undergraduate students.

Open-ended questions ask respondents to write their thoughts in their own words (Fink, 2013), and the questions usually allow participants to provide descriptive and detailed answers, generating richer information about their opinions. Furthermore, they allow researchers to explore and/or reconfirm existing ideas and theories.

The open-ended survey was conducted from 14th till 15th of November 2019. This

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study used the data of the researcher's previous study (Kim et al., 2021). Before conducting the open-ended survey, the information identifying the purpose and procedures of this research was explained. The researcher told the to-be participants that the collected surveys were being used for the development the "Effective Feedback" Instrument (EFI) for higher education. Students were informed that the survey was to be anonymous and it would have no influence on their grades. Those, who showed willingness to participate in this study were provided with a research summary and a consent form. The survey lasted between 15 to 20 minutes.

An online survey was administered to collect data from participants. A questionnaire of three open-ended questions was sent through Google form links. The survey used and modified three questions of Kim's (2011) open-ended questionnaire which explored the characteristics and types of caring instructors perceived by college students. The questions were modified in accordance to the feedback practice. In advance of presenting the questions, students were asked to think about an instructor (upon their entrance into the university) who provided effective feedback during their learning. Following the question, respondents were asked three open-ended questions:

1) What was the subject that the instructor taught?
2) Please describe in detail how the feedback from that instructor differed from others.
3) Please describe in detail how the feedback of that instructor helped your learning of the subject

3.4.2. Data Analysis for Open-ended Survey

To ensure that the data collected was being correctly interpreted, the researcher and an expert in teaching read students' responses numerous times to establish a sense of the data. Data of eight students were excluded due to duplicated submission or/and answers unrelated to the questions, resulting in total of 230 participants for the open-ended survey. The responses were read separately to gain an idea of the key

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themes. The researcher followed the recommendation of Braun and Clarke (2006) about giving full and equal attention to each data item.

In the second stage, codification has been carried out using Atlas. ti 8 software to identify nodes of commonality in the collected data. According to Holsti (1969), coding is "the process whereby raw data are systematically transformed and aggregated into units which permits precise description of relevant content characteristics." (p. 94). The coding process was conducted according to the recommendation of Silver and Lewins (2014). The data of each student response was preliminary assigned with codes. At first, any line of the response which could be important or relevant was coded. Responses often contained more than one type of theme and were therefore multi-coded. Through a selective coding, a total of 1,069 codes has been extracted from the source data which were gradually merged into similar categories. To gain a clear overview of each code and the data attributed to it, initial sub-categories were developed by the researcher and an expert in teaching. A list of identified codes across the data set were printed out for revision. The researcher developed a detailed set of categories from the coding. Next, the expert in teaching independently examined the coding and revised and re-defined the coding categories as needed.

In the third stage, Co-occurring patterns among significant words were grouped together in order to merge and link into the sub-categories. Codes being little used or irrelevant to feedback were eliminated. The whole process was continually compared between the researcher and the expert in teaching.

During the classification process, it became clear that the sub-categories comprised of responses, which referred to the category: 1) characteristics of effective feedback, and 2) the feedback outcome. The main category of 'characteristics of effective feedback' was generated deductively from the feedback literature. At first, the category 'feedback outcome' was conducted inductively identifying strongly to the data themselves, without any analytic preconceptions. The extracted categories and sub-categories were continuously compared, negotiated, and discussed between the researcher and the expert in teaching.

Throughout the time, the sub-categories of 'feedback outcome' were comparable to the framework of self-regulated learning. The classification continued until the researcher

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felt that the saturation was reached. The categories were labeled according to the previous literature of feedback and self-regulated learning. 8 sub-categories were derived with 13 characteristics of feedback types and 30 characteristics of feedback outcome were identified.

To ensure the reliability of the classification of the categories, a researcher in the field of teaching and learning was asked to review the appropriateness of the classification of the codes and the labels. The example of each category, sub-category and codes continued to be reviewed and modified until an agreement was achieved, and the demonstration of the categories became evident.

The reliability of data collection is critical to gain an overall accuracy for the result in the research (McHugh, 2012). To ensure the reliability of the quantified data, inter-rater reliability (IRR) was tested by using nominal comparisons of 1 (presence) or 0 (absence) of the responses assigned to the categories. IRR is a statistical measurement to initiate an agreement between two or more raters coding the qualitative data (Mcdonald, Schoenebeck, & Forte, 2019).

Subsequently, an approach to quantify the ‘characteristics of effective feedback’ and the ‘outcome of feedback reception’ were made by assigning students’ responses into the categories by scoring as either 1 or 0. This is a transitional process necessary to code into dichotomous variable. 1 corresponds to presence and 0 to absence of the responses. Two raters engaged in the coding: One was the researcher of this study, and the other a researcher specialized in teaching and learning. After an initial separate coding, continuous dialogue between the two raters were hold to discuss any variations and disagreements in the coding process. This process was necessary to find a higher agreement for the calculation of the IRR. As absolute agreement was not reached at first, discussion of coding differences was being held until both raters resolved those disagreements. A recoding followed subsequently.

As next, IRR was calculated using Cohen’s Kappa which is known to be appropriate for use when there are two coders coding the same dataset and when the data are nominal (Mcdonald, Schoenebeck, & Forte, 2019). The calculation of Cohen’s kappa was performed according to the following formula :

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$$\kappa = \frac{\Pr(a) - \Pr(e)}{1 - \Pr(e)}$$

P_e signifies the proportion of agreements which is expected to occur by chance alone, while $(P_a - P_e)$ shows the observations referring to the real agreements versus chance agreements (Wynd, Schmidt, & Schaefer, 2003).

According to Landis and Koch (1977), there are different ranges of values for kappa describing the degree of agreement. Values greater than 0.81 represent an excellent agreement, whereas values below 0.40 represent poor agreement. Values range between 0.41 and 0.60 show a moderate value of agreement.

3.5. Procedure 2: Development of EFI

To establish the construct of the ‘characteristics of effective feedback’ and ‘feedback outcome’ for the development of EFI, 1) literature review, 2) open-ended survey, 3) conceptualization of the framework, 4) content validation were conducted for an initial draft for EFI.

For generating items, this study followed the guidelines by DeVellis’ (2012), who states that more items should be derived than what is planned for generation of items of the final measurement. As for example, three to four times larger than in the final instrument would be an appropriate amount of items (Tay & Jebb, 2016). According to Raubenheimer (2004), the number of items per factor is crucial. It is recommended to generate more than three items per factor to achieve an acceptable reliability. This study followed the guidelines of Raubenheimer (2004) for item generation.

A 4-point likert scale was chosen (1= “I strongly disagree”; 2= “I disagree”; 3= “I agree”; 4= “I strongly agree”) for students to score the extent of how much they agreed to each item.

The process of preliminary item generation is shown in <Table 13>.

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<Table 13> Process of preliminary item generation

Stage 1		Stage 2		Stage 3		Stage 4		Stage 5
Conceptualization of characteristics of effective feedback/ feedback outcome	➔	Establishment of the construct	➔	Item generation	➔	Content validation of the construct and item pool through expert panel	➔	Setting of item for the pilot test

After deriving the constructs of the ‘characteristics of effective feedback’ and ‘feedback outcome’, 92 items measuring each factor were generated. The derived items were based on students’ literature review answers of open-ended survey.

There is a need for items to be consistently understood (Boateng et al., 2018). The process of the generation of items requires pilot work to refine the wording (Lettray, 2005). The researcher sought to create the items appropriate for the reading level of the undergraduate students (Clark-Carter, 2004). For this study, consideration was given that the items were stated clearly as possible and that no double-barreled questions were formed. Furthermore, effort were made to frequently revisit the research questions to ensure that the items are representative of these (Oppenheim, 1992).

3.5.1. Content Validation: Introduction of Framework and Preliminary Item Pool

One of the most important steps in developing a measurement tool is 1) to clarify the concept of the construct to be measured, and 2) assessing the content validity of the scale, ensuring that the initial items reflect the intended construct (Arias et al. 2014). Valid labeling of the construct and knowing what one is measuring is crucial when developing an instrument. The content validity is defined as “the degree to which elements of an assessment instrument are relevant to and representative of the targeted

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construct for a particular purpose" (Haynes, Richard, & Kubany, 1995). Content validity is judged by experts with knowledge about the to-be measured content evaluating whether the items reflect the focal constructs. Thus, the content validity depends on the relationship between the definition of the construct and the items generated for the measurement tool.

3.5.1.1. Expert Judgment

To assess the content validity of EFI, the constructs and the preliminary item pool were reviewed by a panel of experts based in the field of education. Content validity is usually established by experts because it is assumed that they know what is important in the content being measured (DeVellis, 2003). Selection of the experts is required to be done on the basis of criteria such as knowledge, professional experience and skills (Park, 2007). Hence, in order to increase the content validity, the selection of an appropriate expert panel is crucial. There has been various opinions in determining the sufficient number of experts. Lynn (1986) recommended a minimum of 3 experts to gain a sufficient validation. However, others have suggested a range of 2 to 10 experts (Davis, 1992; Polit & Beck, 2006; Polit et al., 2007).

The experts for this study were sought to represent different educational background which were: educational psychology, educational technology, and psychometrics. In selecting the panels, the criterion was that the experts were professors or lecturer with extensive experiences in teaching in private and national universities. Experts had sufficient expertise in feedback practice. The demographics of the experts are shown in <Table 14>.

<Table 14> Demographics of expert panels

NO	Area of specialization	Education	Status	Affiliation
1	Educational Psychology	Ph.D	Professor in Education	Private University
2	Educational Technology Teaching-Learning Feedback Research	Ph.D	Professor in Medical Education	Private University

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NO	Area of specialization	Education	Status	Affiliation
3	Educational Technology	Ph.D	Professor in Education	Private University
4	Educational Technology Teaching-Learning Feedback Research	Ph.D	Professor in Education	National University
5	Teaching and Learning	Ph.D	Professor in Marketing	Private University
6	Psychometrics Feedback Research	Ph.D	Instructor in Psychometrics	National University

Each expert was approached by e-mailing, describing the purpose of this study. The panelists expressed interest in participating and assessing the content validity. The experts were asked to answer if the items reflect the generated constructs of feedback.

The procedure included two rounds of content validation. Round 1 was conducted in July 2021, and a content validation form was sent to the experts by email with an instruction which is presented in <Appendix B>. In the form, the definition of constructs and the items were represented. The experts were requested to critically review, provide feedback about the constructs and the item pool. They were asked to provide suggestions, and rate each item. The experts were requested to provide the rates of validity relative to the items with 5-point Likert type scale to judge the items relevancy of construct, and to rate the relevancy of each item as “very low”, “low”, “neutral”, “high”, “very high”. Furthermore, the experts were encouraged to comment on the relevance of the items linked to the targeted constructs. The ratings were entered into the excel spreadsheet.

The average mean score of the ratings and the content validity ratio (CVR) were calculated following the formula of Lawshe (1975). The formula for calculating the content validity is stated as follows:

$$\mathrm{CVR} = \frac{n_e - (N/2)}{N/2},$$

where n_e describes the amount of experts who indicate “high” about the construct relevancy and N refers to the total number of expert panelists. If all items’ relevancies are rated as “high”, the value of CVR will likely compute as 1; and if less than half of the ratings are “low”, the value of CVR might show a negative value. After

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calculating the CVR, redundant and ambiguous items were either modified or eliminated and new items were added if necessary.

Moreover, CVI is the most widely used approach for the content validity in developing a measurement scale (Rodrigues, Adachi, Beattie, & Dermid, 2017). There is an CVI which is calculated with the number of experts giving a rating of “very relevant” for each item divided by the total number of experts. There value ranges from 0 to 1, and CVI greater than 0.79 means that the item is relevant. If the value ranges from 0.70 to 0.79, the item needs revisions. If the value is below 0.70, then the item should be eliminated (Zamanzadeh et al., 2015). However, some researchers (e.g., Lynn, 1986; Polit & Beck, 2006) stated, for six to eight experts, a CVI should show a value of at least 0.83.

Expert panel is recommended to conduct two rounds for content validation (Hall et al., 2018) and this study followed the advise. Round 2 was conducted in October 2021, and experts were provided with summary statistics such as average percentages of each item, and CVR results from Round 1. Every written feedback of the experts provided in Round 1 was taken into consideration for Round 2 of content validation, in order to refine the constructs and items. Revisions were made as appropriate based on the comments. The content validation form for Round 2 is presented in <Appendix C>.

3.5.2. Readability

A pre-test was conducted to gain feedback from students reading the items. Two students were requested, to answer the generated items and to comment on whether they could understand the wording and phrases. Students were invited to mention any ambiguous words they could not understand. Furthermore, the length of the time for completion of the questionnaire was assessed with a duration of 15 to 20 minutes.

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3.6. Survey

In order to develop the “Effective Feedback” Instrument (EFI), this study conducted a pilot test and main test. After discussing the results of the pilot test, the final version for the ‘Effective Feedback’ Instrument (EFI) was produced.

3.6.1. Pilot Test

The researcher visited each class and described the purpose of the research and what participation entailed. The researcher assured that the survey was to be anonymous and it would have no influence on their grades. It was told that the students could withdraw from the survey any time. Participants were asked to select the answer that best described their perceptions of the phenomenon asked in the questionnaire. It was important that they answered the questionnaire in a honest manner, as there was no right nor wrong response. Informed consent and a cover letter was attached in the first page of the paper-pencil form survey and the participants were asked to keep a copy of the consent form. The survey completion took approximately 20 minutes. Thus, it could be assured that the students voluntarily participated in the survey. The questionnaire of the pilot test is presented in <Appendix D>.

3.6.2. Main Test

The researcher visited students classes with confirmation of the instructors before conducting the survey. All participant gave their written informed consent before starting the survey. Some of the surveys were conducted online with the survey program Survey Monkey. Information about the researcher, the purpose of the research, and the anonymity as well as the confidentiality were explained. An introductory form was attached on the first page of the questionnaire, and information about the length, researcher’s contact details, and the ethical approval were stated. The survey completion

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took approximately 20 minutes. The questionnaire of the main test is presented in <Appendix E>.

3.7. Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) was conducted to examine how many factors were to be extracted and whether the generated items were appropriately assigned to the factors based on the factor loadings.

As surveys were returned, raw data was entered into the Microsoft Office Excel spreadsheets for the process of coding. The data analyses were performed using SPSS Version 26.0 for preliminary analyses. Cases were deleted when the data of the case was not complete. Reasons for missing values include unexpected interruptions of the survey.

The data was evaluated using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. In order to determine the efficiency of the factor analysis, KMO measure of sampling adequacy was conducted because it assesses if it is appropriate to use the factor analysis. A ratio close to 1 indicates that the factor analysis can be conducted, whereas a ratio close to 0 indicates that an analysis other than factor analysis should be performed (Hayton & Scarpello, 2004).

As the items of EFI were generated through open-ended questions, exploratory factor analysis (EFA) was conducted to select the final items for the main test. EFA was performed by using SPSS 26.0, to specify the factor structure of EFI. Some researchers (e.g., Fabrigar, Wegener, MacCallum, & Strahan, 1999) found that an oblique rotation may produce a more simple structure than a varimax rotation. In line with this finding, Costello & Osborne (2005) suggested to use oblique rotation since factor inter-correlations are accepted in social science, and this method is known to yield the same results as the varimax rotation. According to the suggestion, this study performed the principal component analysis with oblique rotation solution.

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3.8. Reliability

An important step is to determine the reliability of the instrument. When the instrument has a high level of reliability, then it can be assumed that it can be measured to a wide range of people with predictable results. For the reliability, the internal consistency among the items in each sub-factor was calculated using the Cronbach alpha coefficient. Cronbach's coefficient alpha is the most used internal consistency reliability coefficient in social science research. Variables with poor correlations (r<.40) were highlighted for potential removal.

3.9. Validation Process

Validation is an essential facet for the development of an instrument. The validation process was proceeded as follows: 1) the construct validation, and 2) the convergent and divergent validation, and 3) the concurrent validation. The procedures are described below.

3.9.1. Construct Validity

One method to examine the construct validity is conducing the Confirmatory Factor Analysis (CFA) (Atkinson et al., 2011). Benson (1998) stated that testing the relationship between scores of the new instrument with other measures is to examine the convergent and divergent validity (Kalkbrenner, 2021). Moreover, investigating the relationship between scores on newly developed instrument with existing construct is a method of demonstrating concurrent validity (Swank & Mullen, 2017). The following describes the procedures of the construct validity, the convergent/divergent validity, and the concurrent validity.

After the examination of the descriptive statistics and Exploratory Factor Analysis,

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final items were selected and Confirmatory factor analysis was performed to validate the construct validity by estimating whether the generated items assess the intending latent constructs through testing the goodness of fit of the model. The following indices were used for the assessment of the model fit: Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI).

3.9.2. Convergent and Divergent Validity

In attempting to determine the construct validity of a new instrument, it is necessary to assess its convergent and divergent validity (Carson, Carson, & Birkenmeier, 2016). DeVellis (2017) recommended to include some additional items in the questionnaire that may help in determining the validity of the final scale. The theory asserts that if the phenomenon expected to measure relates to other included constructs, it might serve as an evidence of the validity (DeVellis, 2017). Thus, it was aimed to include items from surveys that already have been statistically validated. The scales can be included with the new instrument to see if they correlate with the generated items for this study, thus providing the evidence that similar constructs are being measured. Following the advise of DeVellis, this study aimed to use the following scales for 1) the validation of the instrument's underlying constructs and 2) the convergent and divergent validity.

The demonstration of convergent and divergent validity is essential in establishing the construct validity (Hinkin, 1998).

Feedback was found to have different impact depending on the academic disciplines in prior literature (e.g., Carless et al., 2020). This research aimed to examine if there was a difference between academic disciplines as revealed in the prior research to examine the convergent and divergent validity. To investigate the difference in academic disciplines, ANOVA was conducted to compare the mean score of the EFI.

The convergent validity was examined by computing the correlation analysis among 10 items of the Academic Self-Efficacy Scale (Kim, 2001), 9 items of the Learning Motivation Scale (Hyun et al., 2005), and 28 items of the Instructor-Student

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Relationship Scale (Kim, 2016). Each correlation analysis was conducted to secure the evidence of construct validity by examining whether the constructs revealed in previous studies also confirms in the tool of this study.

Academic Self-Efficacy (Kim, 2001) was included for convergent validation because feedback positive feedback was found to be an efficient intervention for self-efficacy (e.g., Achterkamp et al., 2015; Brown et al., 2016). Four constructs of the Academic Self-Efficacy were identified as ‘self-confidence’, ‘self-regulatory efficacy’, and ‘task difficulty preference’, and ‘causal attribution’. 10 items of ‘self-regulatory efficacy’ were used for convergent validity, as it was the most appropriate for feedback practice.

Three constructs of the Learning Motivation Scale of Hyun et al., (2005) were added for convergent validity which were the *mastery orientation, performance orientation,* and *performance avoidance.* The goal orientation and feedback has been found to be positively related in prior research (e.g., VandeWalle, Cron, & Slocum Jr., 2001). Therefore, this research aimed to investigate which type of the goal orientation were most correlated with EFI.

The Instructor-Student Relationship Scale (Kim, 2016) involves constructs of *respect, concern, dialogic interaction, trust, expectation, enthusiasm, growth.* In order to assess the convergent validity, all of the items were examined for correlations with EFI, as the constructs were important components of the instructor-student relationship of the feedback situation in prior literature (e.g., Carless & Boud, 2018; Kim, 2005; Lee & Schallert, 2008). An overview of the items of the scales for convergent and divergent validity are presented in <Table 15>.

<Table 15> Overview of scales for convergent and divergent validity

Scale	Construct	Number of items	Item example	Cronbach’s α
Academic Self-Efficacy Scale (Kim, 2001)	Self-regulatory efficacy	10	“I know how to study effectively.”	.84
			“I know accurately what I know and what I don’t know.”	
Learning Motivation Scale (Hyun et al., 2005)	Mastery orientation	3	“I want to learn as much as possible in this class”	.77
	Performance orientation	3	“My goal in this class is to achieve better grades than	.84

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Scale	Construct	Number of items	Item example	Cronbach's α
			others."	
	Performance avoidance	3	"In this class, I want to avoid as much as I can being worse than others."	.89
Instructor-Student Relationship Scale (Kim, 2016)	Respect	4	"My instructor tries to understand the perspectives of students."	.85
	Concern	4	"My instructor tries to remember students' names and calls them by their name."	.89
	Dialogical interaction	4	"My instructor enjoys talking and exchanging opinions with students in class."	.84
	Trust	4	"I trust the teaching of my instructor."	.86
	Expectation	4	"My instructor seems to believe in students' abilities."	.84
	Enthusiasm	4	"I can see the passion for teaching of my instructor."	.87
	Growth	4	"I want to do my best and put effort into the class of my instructor."	.83

3.9.3. Concurrent Validity

Concurrent validity was examined by computing the correlation analyses among 10 items of the Formative Feedback Practice Scale (Yeom & Kang, 2020) and 10 items of the Feedback Literacy Scale (Park & Sohn, 2019).

Three constructs Formative Feedback Practice Scale (FFPS) were included for concurrent validity which were *planning*, *process*, and *encouragement*. The items of these constructs were examined for concurrent validation with the 'characteristics of effective feedback'. For the Feedback Literacy Scale (FLS), *feed-up*, *understanding*, *feedback seeking*, *affect* were investigated for correlations with 'feedback outcome'. An overview of the items of the scales for convergent and concurrent validity are presented in <Table 16>.

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<Table 16> Overview of scales for concurrent validity

Scale	Construct	Number of items	Item example	Cronbach's α
Formative Feedback Practice Scale (Yeom & Kang, 2020)	Planning	4	"My instructor prepares specific feedback for students to modify their performances."	.75
	Process	5	"My instructor encourages students to respond to feedback."	.80
	Encouragement	4	"My instructor provides positive feedback involving praise and encouragement."	.79
Feedback Literacy Scale (Park & Sohn, 2019)	Feed-up	1	"I know what the learning goals for this class are."	.787 - .909
	Understanding	3	"Through feedback, I can identify areas that I either didn't know or did wrong."	
	Affect	3	"Through feedback, I believe that I will improve in my learning."	.819 - .892
	Feedback-seeking	3	"I seek help when I do not understand the feedback."	

4. Results

This research focused on two main objectives that were: 1) to investigate how 'Effective Feedback' is conceptualized, and 2) to examine how valid and reliable the 'Effective Feedback' Instrument is.

First, a conceptual framework and a preliminary item pool of the 'characteristics of effective feedback' and 'feedback outcome' were derived based on a thorough literature review and open-ended survey based on undergraduate students' perceptions.

Second, following the generation of the framework and initial item pool, content validation for the pilot test was conducted. Through the exploratory factor analysis, appropriate numbers of factors for EFI were presented, followed by the selection of items that were assigned to the factors based on the factor loadings.

Third, after examining the descriptive analysis and the internal consistency (reliability)

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of the final instrument, validation of the final instrument was followed by investigating the 1) construct validation, 2) the convergent and divergent validation, and 3) the concurrent validation.

4.1. Conceptualization of 'Characteristics of Effective Feedback' and 'Feedback Outcome'

This study used both deductive and inductive approaches. It was found to be essential to expand the findings from existing literature on feedback by gaining insights of students' perceptions of the 'characteristics of effective feedback' and the 'feedback outcome' after receiving feedback.

Two main categories emerged from the analysis of the data which was elicited by the open-ended survey. One type of the category reflected on the perceptions and experiences of receiving 'effective feedback' upon entry into the university. The other category described the outcome of receiving feedback from the instructors.

To explore the reliability of the coding process, Inter-rater reliability test was conducted to find an agreement in the coding process of the collected data from the open-ended survey. The reliability of 0.80 or higher is sought to be acceptable (Nunally & Bernstein, 1994). Following the inter-rater reliability check to measure the agreement between the coders in this study, the Cohen's kappa weight showed a reliability value between 0.91 and 0.97, which represented an almost perfect agreement.

From the responses of 230 students, 460 phrases were extracted which provided descriptive, distinctive, and detailed impressions that described the 'characteristics of effective feedback' and the 'feedback outcome'.

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4.1.1. ‘Characteristics of effective Feedback’ based on Open-ended Survey

To reveal the ‘characteristics of the effective feedback’, student responses were classified into 4 sub-categories describing 13 characteristics as shown in <Table 17>. It shows an overview of the findings, with response frequencies reported to provide a broad indication about the characteristics of effective feedback.

<Table 17> ‘Characteristics of effective feedback’ based on open-ended survey

Category	Sub-category	Characteristics	N(%)
Characteristics of Effective Feedback	Detailed feedback	• Detailed explanation with examples • Going into details • Explaining in detail about what was done well, and what should be improved • Providing appropriate reasons and solutions • Providing additional in-depth content • Specific examples of situations • Detailed explanation of pros and cons • Clear answer • Meticulous feedback	167(72.6)
	Guiding Feedback	• Providing sharp question for critical thinking • Follow-up questioning after student’s answer • Providing reverse questions	91(39.6)
	Acknowledging Feedback	• Confirming student’s statement • Expressing acknowledgement and respect towards a student • Showing respect towards one’s opinion • Expressing Sympathy	36(15.7)
	Timely Feedback	• Real-time feedback • Direct feedback • Providing feedback on-the-spot	13(5.7)

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Detailed Feedback

Most frequent responses conveyed detailed feedback as an effective feedback characteristic revealing 167(72.6%) comments. Students characterized 'effective feedback' as providing detailed explanations about their work, identification of what was done well and what to be improved in student work, providing appropriate reasons and solutions, and delivering clear answers that helped students to gain an idea of what was expected.

> *"The instructor provided very specific feedback about what I did well and what I needed to do for improvement." (female, department of korean language education)*

> *"The feedback was provided with specific examples, and I found that this feedback was best applied in my learning." (male, department of chemistry education)*

> *"The feedback I received was not formal or superficial, but it was explained in a very in-depth way and it was really detailed." (male, department of mathematics education)*

> *"After the essay test, I once sent an e-mail to my instructor because I had some questions about my grades, and he clearly defined and explained the assessment criteria. He also gave me detailed written feedback about in what part I was lacking and in what part I did well." (female, department of food and nutrition)*

> *"I was able to create my art work because my instructor showed us a demonstration so that we could understand how we could approach our work." (female, department of furniture and ceramics design)*

Guiding Feedback

Guiding feedback focuses on comments and suggestions to assist students in their own revision on their tasks. Thus, prompts, hints, sharp questions and reverse questions were provided to engage students constantly reflect on how they could approach to their learning and improvement. 91(39.6%) students mentioned guiding feedback as effective.

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"The instructor did not just say that I was wrong. She asked questions to make me review and reflect on myself to find out how I came to this specific result or outcome. And she provided some suggestions on how I could improve." (male, department of mechanical engineering)

"During my presentation, the instructor asked me about how I came to my thought, what the rationale was, and pointed out on what I may have overlooked in my work. He also provided ideas to think about for all students in class (...). Thus, the instructor continuously kept asking questions to elicit further thoughts about my work." (female, department of mathematics education)

"In the case of feedback on learning, the instructor used reverse questions to guide me in solving the problems on my own. (...) The instructor asked with what questions I had trouble to answer in the exam, and why I thought that my answer was wrong. He showed me a direction on what I needed to pay attention to for the future." (male, department of korean language education)

"My instructor did not directly provide the right answer. He gave me a feedback that led to find the answer on my own."(female, department of biochemical and polymer engineering)

"Many instructors just don't provide any feedback, but this instructor always provided suggestions to students and asked questions." (female, department of history and culture)

Acknowledging Feedback

A number of students mentioned that feedback with acknowledging, confirming, and encouraging purposes motivated them to put more effort into their work. Acknowledging feedback is typically used to recognize one's strength, achievement or success. Showing respect towards one's opinion seemed to enhance students' motivations. It seemed to stimulate improvement, and especially the confidence in students. 36(15.7%) responses mentioned the importance of acknowledgement from teachers. Those students who

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highlighted the nature of respectful and encouraging feedback indirectly stated that their confidence and self-efficacy were affected by positive feedback.

> *"I received compliments and feedback about my ideas which showed genuine appreciation of my work." (female, department of biochemical and polymer engineering)*

> *"It was in the subject of 'leisure sports' where I received a feedback that I generally had all the basics I needed. The instructor boosted my confidence by saying that I could do better if I put effort into it." (female, department of physical education)*

> *"The instructor always provided feedback in a positive and encouraging manner, and emphasized what I did well when giving feedback." (female, department of special education)*

> *"I really appreciated when my instructor talked about my improvements." (female, department of english education)*

> *"The instructor praised about my strengths in my drawing and acknowledged my potentials by giving compliments in individual assignments." (female, department of fine arts)*

Timely Feedback

13(5.7%) student responses indicated that effective feedback was provided in an immediate and direct manner because it let students know what they had done wrong or right. Besides receiving feedback on the spot in class, when students had questions outside of the class, the instructors replied immediately to their questions using e-mail or messages. Furthermore, immediate feedback returned within days on assignments and tests were appreciated because there was interest in students to review the feedback.

> *"The instructor immediately wrote down the feedback on a piece of paper and gave it to me directly." (female, department of english education)*

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"When I contacted my instructor regarding to some questions, he replied very quickly. I especially appreciated that we communicated through e-mails so that I could receive informations without any difficulties." (male, department of physical education)

"Every time in class, we received feedback on assignments that we submitted." (female, department of korean language education)

"If there was something wrong in my interpretation, the instructor gave feedback on the spot." (female, department of chinese culture)

4.1.2. 'Feedback Outcome' based on the Open-ended Survey

To reveal the characteristics of the 'feedback outcome', student responses were classified into 4 dimensions with 8 sub-categories, describing 30 characteristics as shown in <Table 18>. It represents an overview of the findings, with response frequencies reported to provide a broad indication about the characteristics of the feedback outcome.

<Table 18> 'Feedback Outcome' based on open-ended survey

Category	Dimension	Sub-category	Characteristics	N(%)
Outcome of Feedback	Cognitive strategy	Understanding	• Understanding of the subject • Higher-level understanding • New knowledge • Support in learning • Application in the next task • Avoiding mistakes recalling the feedback • Help in learning in general through feedback	150(65.2)
		Learning Strategy	• Effective learning • Clearly defining a strategy for study • Knowing how to approach a task/exam after receiving feedback • Strategy of problem solving	

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Category	Dimension	Sub-category	Characteristics	N(%)
	Metacognitive strategy	Self-reflection	• Identifying shortcomings • Reflecting on learning • Figuring out what's missing when learning • monitoring for better improvement	66(28.7)
	Behavioral strategy	Effort	• Investing effort upon receiving feedback • in-depth study • engaging in class	57(24.8)
		Help-seeking	• Taking the initiative to seek for help after receiving feedback	
	Motivational strategy	Intrinsic motivation	• Willingness to engage in class • interest in the subject and class • Enthusiasm for learning • Being in flow	113(49.1)
		Self-efficacy/ confidence	• Turning asking into a habit • Assurance about oneself • Being prepared/ready (i.e. presentation) • Pride	

Cognitive Strategy

Students who identified the characteristics of the 'feedback outcome' used adjectives describing the cognitive strategy. The most commonly reported cognitive strategies included 'understanding', 'higher level understanding', 'acquiring new information', 'defining a strategy for learning', and 'learning how to approach a task/exam'. 150(65.2%) responses reported that feedback positively influenced on their cognitive strategies. Thus, feedback helped students to understand the learning material and learning in general in that they were able to avoid to do the same mistake in another learning situation. In respect, students accounted:

"The detailed feedback helped me to understand the subject." (female, department of biochemical and polymer engineering)

"I learned so much, not only things that were new to me, but I learned things that were not widely known."(male, department of law)

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"Feedback helped me to build a clear structure for my report." (female, department of business administration)

"I was able to apply feedback in next tasks." (female, department of physical education)

"Feedback definitely helped me to correct my mistakes, and most importantly, I was able to avoid to do the same mistake in other situations." (female, department of physical education)

"When studying my major, I started to think about the examples that my instructor has shown before." (female, department of business administration)

"Thanks to the feedback provided by my instructor, my ability has visibly increased in writing and there was improvement in identifying the problems stated in the exam of the teacher certification." (female, department of earth science education)

Metacognitive Strategy

Students described that the feedback promoted their development of the meta-cognitive strategy. The self-reflection 66(28.7%) responses indicated how feedback has been useful to think more critically about their work, to develop their standpoint about what was needed for improvement, and to see their learning from a new perspective for improvement.

"After receiving feedback, I knew where I needed to improve, but then also in what part I did well. And that was definitely good, because it helped me to prepare more effectively for the exam." (female, department of mathematics education)

"Upon receiving feedback, I started to review my assignments more thoroughly." (female, department of earth and science education)

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"When I read an essay about the same theme, it was interpreted very differently than how I did. That was the moment when it enabled me to broaden my perspectives." (female, department of korean language education)

"I got to pay more attention to the points that I needed to improve." (female, department of english language and literature)

"I was able to think again about the method I used in proving." (male, department of mathematics)

Behavioral Strategy

57(24.8%) student responses indicated that feedback encouraged them to put more effort in learning, as for example, investing effort to engage in class. Their interest about the subject had increased and feedback played an essential role in enhancing students' courages to ask questions or to seek for help to teachers when there was an unanswered question.

"I started to pay more attention towards other students presenting their work in class. And I took more time and effort in preparing my presentation." (female, department of trade)

"My interest for the subject has increased, and I naturally concentrated in my course asking more questions than ever before." (male, department of marine engineering)

"I asked more questions than in other classes and that helped me the most." (male, department of mathematical education)

"It was a little awkward when I received feedback for the first time, but it led me to put more effort in my next assignments and I was able to change my bad habit in writing." (female, department of performing arts)

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Motivational Strategy

113(49.1%) responses related to the different motivational strategies, as for example, ‘willingness’, ‘pride’, and ‘confidence’ that led to student engagement in learning. Increase of the enthusiasm for learning, the willingness to work harder, and being in flow was identified by students. Moreover, the participants stated that after receiving feedback from teachers, they were more convinced about themselves and their performance leading them to express their opinions in class.

“The compliment of my instructor definitely made me like the subject more than before.”(male, department of mechanical engineering)

“Thanks to the individual feedback of my instructor, the class was more enjoyable.”(female, department of performing arts)

“After receiving positive feedback about my eye contact and tone during my presentation, I started to believe in my strengths.”(female, department of english language)

“It was easier for me to express my opinion because my instructor provided questions to think about.”(male, department of chemistry education)

“It was in that time when I was very depressed. However, my instructor gave me very detailed compliments about my work, and that was the moment when my confidence increased.”(female, department of fine arts)

“After receiving feedback, I was not afraid anymore to ask questions, and I gradually found it very natural to go and ask.” (female, department of korean language)

“I felt that I could be ensured to ask questions any time I wanted to.” (female, department of arabic language)

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4.1.3. Conceptual Framework of the 'Characteristics of Effective Feedback' and 'Feedback Outcome'

The responses of the open-ended survey and literature review were synthesized to re-conceptualize and complement the constructs of the 'characteristics of effective feedback' and the 'feedback outcome'.

The primary constructs of the characteristics of effective feedback, *elaborated feedback*, *facilitative feedback*, *positive feedback*, *interactive feedback*, and *immediate feedback*, were based on a literature review. It was found that the derived responses of the open-ended survey included the characteristics of effective feedback, as stated in the review of the literature, but the analysis of the open-ended survey represented additional perspectives that led to a relabeling to: *detailed feedback*, *guiding feedback*, *acknowledging feedback*, *interactive feedback*, and *timely feedback*.

Detailed feedback stems from *elaborated feedback*, which is defined as feedback that contains information on why the answer/response is correct or incorrect after a simple verification. Additional instructional information and/or examples corresponding to the learning material could be provided to show how to solve specific problems and demonstrate an ideal answer. Moreover, specific guidance on improving learning is a crucial component of elaborated feedback. Students' responses to the open-ended survey involved detailed, specific, and clear explanations describing the elaboration of feedback. Students did not directly view feedback as information, as it is often defined in prior research. For students, the explicit and specific way of providing explanations, reasons, and knowledge was important because the specific instructions ensured their understanding of learning.

Guiding feedback refers to *facilitative feedback* from literature. *Facilitative feedback* involves hints and/or clues and suggestions to help students find the correct solution on their own. If elaborated feedback provides instructional information to guide the student to build a deeper understanding of the task, facilitative feedback helps them to learn more independently by providing clarification questions and open-ended questions. However, students' voices of the responses showed words which were indicated

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challenge, for example, “sharp questions” “follow-up questions,” and “reverse questions” that involve an element of guidance as opposed to the passive definition of facilitative feedback obtained from the literature review.

Acknowledging feedback is compatible with *positive feedback*, which involves praise, encouragement, and recognition of student performance. This type of feedback is often seen as a crucial contributor in eliciting students’ uptake of feedback, as it influences their self-esteem and motivation. The open-ended survey on acknowledging feedback emphasizes emotional and relational support, revealing that students appreciated the instructors displaying respect and sympathy about their opinions. Acknowledgement and confirmation occurred a number of times in the answers, leading to the label of *acknowledging feedback*.

Interactive feedback was initially not coded in the open-ended survey responses. Its integration was drawn after expert judgment, as stated in Section 4.2.1.2. The potential of interactive feedback to promote effective student learning has been articulated by several researchers (e.g., Steen-Utheim & Wittek, 2017; Yang & Carless, 2013). Even if the amount was small, interactive feedback was mentioned in students’ responses to the open-ended survey, and it was coded into the characteristics of the instructor, such as through traits like showing care, concern, and interest towards students, rather than as a characteristic of feedback. Prior literature (e.g., Carless et al., 2020) that investigated feedback culture across academic disciplines revealed that students majoring in architecture thought feedback to be most effective when it was delivered interactively between the instructor and students. Increasing educational studies have expressed the fundamental role of interactive feedback, as it promotes further understanding, reflectivity, and meaning-making of learning materials (Steen-Utheim & Wittek, 2017). Interactive feedback is essential as it facilitates cognitive as well as emotional aspects (Pitt, 2015; Yang & Carless, 2013). Thus, interactive feedback is integrated into the conceptual framework.

Timely feedback ranges from feedback delivered immediately after a task to being delivered on the same day. However, immediate feedback, which refers to other types of feedback, is not always considered effective in learning. The feedback literature (Butler et al., 2007; Kulik & Kulik, 1988; Metcalfe et al., 2009) has revealed the

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contradictory effects of immediate feedback. Nonetheless, the words “real-time,” “direct,” and “on-the-spot” were compatible with immediacy, rather than delay. Thus, for this study, the label “timely feedback” seems to be the most appropriate, as timely feedback exists within a time frame of students’ interest.

The characteristics of the feedback outcomes were derived as: *understanding*, *learning method*, *self-reflection*, *effort*, *help-seeking*, *intrinsic motivation*, and *self-efficacy/confidence*. These characteristics indicate how feedback is integrated with self-regulated approaches.

Understanding and *learning methods* refer to cognitive strategies of self-regulated learning. It is the process of understanding the learning material after receiving feedback and identifying the scope for improvement. Through the open-ended survey, a number of students indicated that feedback helped the learning process in general, indicating enhanced comprehension. The comprehension, in turn, led to the application of the feedback in subsequent assignments. It also ensured that mistakes were avoided because students could recall the feedback received from the instructor. Thus, a strategy of how to approach a task was derived, which led to changes that resulted in better performance. Students valued feedback highly as they could employ a specific approach which are considered to be important for evaluations in higher education to tasks and exams.

Self-reflection is a metacognitive approach that involves looking back to process past experiences, and an internal mental process that involves checking, verifying, and correcting one’s performance (DiGiacomo, 2014). Students may think critically about their work and performance to review what needs to be improved by integrating various perspectives after receiving feedback. In the open-ended survey, students valued feedback because it helped them spot any shortcomings by identifying what was missing in their learning process.

Effort and *help-seeking* refer to behavioral strategies of self-regulated learning. Students may invest more effort in the task upon receiving feedback. Furthermore, help-seeking behavior has been shown to be important in the learning process in prior literature (Leeknecht, Hompus, & Schaaf, 2019; Vande Walle, 2003). Accordingly, the open-ended survey revealed that students took the initiative to seek help after receiving

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feedback from their teachers. Furthermore, feedback seemed to facilitate deeper learning in students, that is, they were more perseverant while completing tasks.

Intrinsic motivation, *self-efficacy*, and *confidence* refer to the motivational strategy where enthusiasm for learning and willingness to work harder are enhanced upon receiving feedback. Continuous feedback may lead one to enjoy the class, become more confident in asking questions, and gain assurance about oneself and one's performance. Positive feedback is known to increase intrinsic motivation (Deci, 1972). Moreover, the open-ended survey results revealed that this type of feedback enhanced students' self-efficacy and confidence. Their willingness to engage in class has increased, and they appear to be more interested in the subject and the learning material. Self-efficacy was enhanced because the students felt prepared for presentations or exams. The conceptual framework synthesized from the literature and the responses to the open-ended survey are presented in <Table 19>.

<Table 19> Conceptual framework of 'characteristics of effective feedback' and 'feedback outcome'

Dimension	Feedback	Characteristics *Providing/Expressing...*
Characteristics of effective feedback	Detailed Feedback	• Specific and detailed explanation of what was done well • Details of what needs to be improved • Reason or evidence for marks or grades • Specific and clear direction on how to revise the task • Information about what is expected • Clear examples
	Guiding Feedback	• Clues or prompts for helping students to find the answer • Suggestion of rough direction without revealing the answer • Questions about the learning content before providing revealing the answer • Questions to promote critical thinking • Follow-up/Reverse questions to guide students to clarify/explain on their own
	Acknowledging Feedback	• Acknowledgement and respect towards students (i.e., students' thoughts or opinions) • Encouragement by emphasizing strengths • Supportive message • Sympathy towards students
	Interactive Feedback	• Opportunity to communicate when receiving feedback • Opportunity for interaction to check on students' opinions/understandings • Adding on/restating students' responses for a better understanding

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		• Providing opportunity for students to clarify their thoughts
	Timely Feedback	• Feedback soon after submission of assignments • Quick reply within a short time frame • Feedback on-the-spot
Dimension	**Outcome**	**Characteristics** ***Feedback helps in...***
Feedback Outcome	Understanding (cognitive)	• Understanding the subject and learning content • Identifying the goal of the subject/learning • Acquiring new knowledge • Studying for exam/task • Understanding about one's performance • Applying the feedback in next task/assignments • Avoiding mistakes
	Learning method (cognitive)	• Understanding the method of how to approach learning • Acquiring effective way of learning and problem solving • Preparing for exams/class activities • Remembering feedback for future assignment
	Self-reflection (metacognitive)	• Reflecting on learning and oneself from a different perspective • Monitoring for improvement • Finding out what's missing when learning
	Effort (behavioral)	• Investing effort to engage/pay attention in class • Persisting to finish the task • Investing effort of using the feedback
	Help-seeking (behavioral)	• Taking the initiative to seek out for help (i.e., about an effective approach for learning, learning material) • Asking more questions in class/to the instructor • Asking for clarification of feedback
	Intrinsic motivation (motivational)	• Increase of one's interest/enthusiasm for the subject/learning • Participating actively in class • Enjoying the class • Willingness to work harder
	Self-efficacy/confidence (motivational)	• Increase of confidence about one's ability/oneself (i.e., in asking questions) • Being prepared for tasks/class activities • Believing in oneself and the performance

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4.2. Development of EFI

The following describes the result of the development of 'Effective Feedback' Instrument. The procedure of the item generation for the pilot study is described, undergoing the process of content validity and consistent modification of the items for constructing the final instrument of EFI.

4.2.1. Content Validation

Content validity includes as for instance, the validity and the degree of representativeness of the construct, the clarity and wording aspects of the items (Koller, Levenson, Glück, 2017). To examine the appropriateness of the generated constructs, the purpose of the content validity was to examine 1) the degree of whether the definition of the constructs were appropriate, and 2) whether the items of the instrument sufficiently represented the constructs that were defined by the researcher.

4.2.1.1. Development of the Draft Version of EFI

The 'characteristics of effective feedback' and 'feedback outcome' was redefined and conceptualized through the literature review and the analysis of the open-ended survey. Items were developed representing the constructs of the two sub-scales (characteristics of effective feedback and feedback outcome), and effort was made to integrate students' expressions and wording from the survey responses into the items so that the items could appropriately portray the feedback practice in higher education.

92 preliminary items were derived that represented the conceptual framework of the two concepts. Raubenheimer (2004) stated that at least three items should significantly load on each factor in an instrument for a successful identifications of the sub-scales. Moreover, it is suggested that the initial number of items should be twice the desired

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number of the final instrument (Morgado et al., 2017; Nunally, 1978). Following this criteria, this research attempted to select four items for each factor, resulting to about 96 preliminary items.

The preliminary item pool underwent the content validation through the expert judgment to measure the appropriateness of the constructs of the two sub-scales (characteristics of effective feedback and feedback outcome) and to select sufficient items for the pilot study.

4.2.1.2. Expert Judgment

Round 1 of the content validity process was carried out in July 2021, and Round 2 was conducted in October 2021. Six recruited expert panels responded through e-mail. In both rounds, all experts received a cover letter including the definitions of the constructs.

In Round 1, The expert panels rated the validity items generated from the constructs, if they reflected the proposed constructs. Notably, one expert panel expressed an opinion to integrate the *interactive feedback* which is based on the social constructivism theory. The expert found that the characteristics of effective feedback were limited on the traditional feedback as one-way communication. Therefore, the researcher decided to conduct an extant review of the interactive feedback to extend the characteristics of effective feedback. Although minor, the interaction between the instructor and students was mentioned in the open-ended survey responses, but it was not coded as interactive feedback. The emphasis of the *interactive feedback* arises mainly from the limitations identified in studies of feedback in higher education (e.g., Beaumont, O'Doherty, & Shannon, 2011; Yang & Carless, 2013). Thus, effort was made to integrate the *interactive feedback* as a complementary data for the result. *Interactive feedback* in this study was defined as feedback to facilitate the interaction for the co-construction of knowledge and understanding, and to clarify a statement by reconstructing the meaning.

Timely feedback was most seen as appropriate because the term *immediate feedback* was not always found to be effective in prior research (e.g., Brackbill, Bravos, & Starr,

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1962; Brackbill, Isaacs, & Smelkinson, 1962). Furthermore, it was found that the immediacy in timing of feedback was perceived differently by each student. Therefore, the term 'timely' was assumed to be appropriate for describing effective timing of feedback so that it referred to a time frame ensuring that students' interest was not lost. As a result, five constructs of the 'characteristics of effective feedback' were derived for the item generation.

Intrinsic motivation and *self-efficacy* were merged into *Autonomous motivation* because feedback is an extrinsic source. Autonomous motivation is defined as "motivation arising out of genuine interest or personal endorsement or valuing of an activity." (Kusurkar, 2019, p. 1083).

After investigating the degree of sufficiency of the definition of the constructs, the 92 items representing the constructs were examined, and repetitive and double-barreled items were either removed or modified accordingly to ensure the content validity of the items. Furthermore, the accuracy of the vocabulary was reviewed, and items that were not found to be related to feedback, were either removed or modified suitable to the feedback situation. For instance, the item "The instructor provides examples (pictures, books etc.) so that the students could better understand the feedback" was modified into "My instructor provides detailed feedback by showing good examples of other students."

Guiding feedback included items about how to approach a task, as for instance "My instructor explains about how to revise the assignment." However, through the process of the content validation, items that referred to effective approach to a task, were reclassified into detailed feedback.

In Round 1, the expert panels generally expressed opinions about the labels, and the appropriateness construct definitions. Labels and the structure of the constructs were gradually modified in respect to the opinions of the panelists throughout the two rounds of the content validity.

The 5-point likert scale was chosen to measure the level agreement of the expert panels. The experts were requested to rate the relevancy of each item as 1= "very low", 2= "low", 3= "neutral", 4= "high", 5= "very high".

The mean of the validity rate, and the Content Validity Ratio (CVR) following the formula of Lawshe (1975) were calculated. The Content Validity Index (CVI) was

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calculated which is an agreement procedure to evaluate the relevance of the items to the domain of the content represented in an instrument (Wynd, Schmidt, & Schaefer, 2003). Furthermore, participants of the expert panel were asked to provide comments on suggestions regarding each construct of the primary measurement scale.

The average rating score below 3.5 were either discarded or modified if the item was found to be essential in reflecting the construct. The criteria for the minimum value of CVR was determined by the number. For five expert panels, the criteria for minimum CVR was found to be .99 (Lawshe, 1975). Thus, for this research, items with the CVR below .90 were examined for either elimination or modification.

Lynn (1986) provided a guideline regarding an acceptable value of CVI and suggested for six experts, CVI should not be less than .83 (Polit, Beck, & Owen, 2007). Therefore, items with CVI value between 0.40 to 0.50 were not taken into account for Round 2 of the expert judgment.

Taken together, three criteria (average score, CVR, CVI) were all considered evaluation of the content validity and selection of the items. However, some items that did not meet the criteria were still considered for modification if the content of the item was found to be essential in representing the construct. For instance, in Round 1, the CVR of the item ‘Feedback helped me to study/practice for exam/task’ was .67 which did not meet the criteria. However, as the average score revealed a value of 3.83 and the CVI 0.83, the item was modified into ‘Feedback was helpful in studying/reviewing for exam/task’. Similarly, the item ‘With the help of the feedback, I was able to review for which areas I needed to study’ revealed a CVR score of .67, mean score=3.83, and CVI=0.83, which was modified into ‘Through feedback, I started to see what my strengths and weaknesses are.’ It is important to note, however that effort was made to accept items with CVR of 1.00 for the next expert judgment. The item pool for Round 1 is presented in <Appendix 1>.

For Round 2 of the content validity, 74 items were reviewed by the same expert panels who participated in Round 1. Equally as Round 1, the content validity was calculated through the average score, CVR, and CVI. Some items with 0.68 of CVI were modified. For instance the item ‘My teacher shows interest in students’ opinions’ was modified into ‘My teacher provides feedback in an suggestive manner considering

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students' feelings', in accordance to the advises of experts.

The item 'Feedback induced active participation in class' had a CVR ratio of 0.00. However, class participation was found to be an essential component of learning and motivation. Prior studies (Klieme, Leutner, & Kenk, 2010; Hattie et al., 2015) revealed that positive feedback is positively correlated with intrinsic motivation, which in turn facilitates classroom participation in students. Therefore, the item was modified into 'Feedback made me want to actively participate in class'. Similarly to Round 1, some items with CVR ratio of 0.67 were not deleted because the CVI showed an acceptable ratio of 0.83, and/or the average score showed an acceptable value between 3.50 to 4.83 for 'characteristics of effective feedback'. There were two items with the average scores of 3.00 which were eliminated.

The average scores for 'feedback outcome' ranged between 3.17 to 4.83. The item 'Through feedback, I was able to avoid in repeating the same mistakes.' showed a average score of 3.33. However, the importance of preventing the same mistakes on subsequent tasks has been mentioned in students' voices about feedback in prior research (Marrs & Stringer, 2016). Therefore, the item was modified into 'Through feedback, I believe that I won't repeat the same mistake again'. The item 'I started to contact or ask my instructor directly for a meeting to receive some feedback' was modified into 'After receiving feedback, I started to request a face to face meeting when I needed help regarding class activities/assignments.' The experts requested to emphasize on 'after receiving the feedback', so that the change in help-seeking behavior was clear. The item pool for Round 2 is presented in <Table 20> for the 'characteristics of effective feedback', and <Table 21> for the 'feedback outcome'.

<Table 20> Round 2 of content validity for 'characteristics of effective feedback'

Construct		Preliminary item (Round 2)	Content Validity			Pilot test item
			M(SD)	CVR	CVI	
Detailed Feedback	1	My instructor provides detailed feedback on what was done well and what needed to be improved.	4.67 (1.55)	1.00	1.00	**(accepted)** My instructor provides detailed feedback on what was done well and what needed to be improved.

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Construct	Preliminary item (Round 2)		Content Validity			Pilot test item
			M(SD)	CVR	CVI	
	2	My instructor explains in detail what was right and wrong.	3.83 (1.21)	0.67	0.83	**(modified)** My instructor explains in detail what has been appropriate and what was not.
	3	My instructor explains in detail the evidence for the given marks or grades.	4.50 (0.98)	1.00	1.00	**(accepted)** My instructor explains in detail the evidence for the given marks or grades.
	4	My instructor provides detailed feedback by showing good examples of other students.	4.33 (0.75)	1.00	1.00	**(modified)** My instructor provides detailed feedback to the assignments or performance by showing detailed examples.
	5	My instructor explains in detail the process of how the ideal answer could be derived.	3.83 (1.17)	0.67	0.83	**(modified)** My instructor explains in detail how to find the ideal answer.
	6	My instructor explains how to revise the assignment.	4.00 (1.17)	1.00	1.00	**(modified)** My instructor gives a specific direction on how to revise the assignment.
	7	My instructor provides detailed information about the expected format and draft for the assignment.	4.00 (1.37)	1.00	1.00	**(modified)** My instructor informs in detail whether the assignment fits the expected format and draft.
	8	My instructor demonstrates how to fulfill the task in an effective way (solving problems, applying concepts etc.)	3.67 (2.07)	0.67	0.83	**(deleted)**
	9	My instructor demonstrates how to apply learned concepts in other situations.	3.67 (2.34)	0.67	0.83	**(deleted)**
Giding feedback	1	My instructor provides clues (prompts) to help students in finding the answer on their own.	4.83 (1.60)	1.00	1.00	**(modified)** My instructor provides clues (prompts) in class or assignments, to help students in finding the answer on their own.
	2	My instructor provides clues (prompts), rather than telling the student what was right or wrong, so that students can revise by themselves.	4.00 (1.47)	0.67	0.83	**(modified)** My instructor provides hints so that the students can find out by themselves if the answer is right or wrong.
	3	My instructor asks for opinions about the learning content or problems.	3.33 (1.03)	0.67	0.83	**(modified)** My instructor provides questions about the learning content or problem so that the students can revise the performance or task by their own.

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Construct	Preliminary item (Round 2)		Content Validity			Pilot test item
			M(SD)	CVR	CVI	
	4	My instructor requests to explain the thought in detail.	4.17 (0.52)	1.00	1.00	**(modified)** My instructor requests to clarify students' thoughts so that the student can improve on his/her own.
	5	My instructor provides suggestions like "What do you think about trying this?" instead of controlling students' thoughts.	3.83 (1.17)	0.67	0.83	**(modified)** My instructor suggests a rough direction about how the performance/assignment should be revised, but he/she lets students find specific ways of doing it.
	6	My instructor provides advising feedback but respects students' choices.	3.00 (1.63)	0.00	0.50	**(deleted)**
	7	My instructor acknowledges students' ideas by providing feedback in a thoughtful tone.	3.00 (2.12)	-0.20	0.40	**(deleted)**
Acknowledging feedback	1	My instructor praises and acknowledges students' achievements or results of the work.	4.33 (1.47)	1.00	1.00	**(modified)** My instructor praises and acknowledges students' process of improvement to encourage the efforts given.
	2	My instructor acknowledges and encourages student's process of improvement.	4.50 (1.17)	1.00	1.00	
	3	My instructor praises students when they were doing their best.	4.00 (0.75)	1.00	1.00	**(modified)** My instructor acknowledges students' thoughts and provided feedback in a thoughtful tone.
	-		-	-	-	**(added)** Instead of criticizing me, my instructor provides feedback in an encouraging way.
	4	My instructor encourages the student by emphasizing the strengths rather than weaknesses.	3.83 (0.98)	0.67	0.83	**(modified)** When pointing out areas for improvement, my instructor also acknowledges the strengths of the student.
	5	My instructor gives supportive messages to students.	4.00 (0.63)	1.00	1.00	**(accepted)** My instructor gives supportive messages to students.
	6	My instructor shows interest in students' opinions.	3.33 (1.63)	0.33	0.67	**(modified)** My instructor provides feedback in a suggestive manner considering students' feelings.

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Construct		Preliminary item (Round 2)	Content Validity			Pilot test item
			M(SD)	CVR	CVI	
Interactive feedback	1	My instructor provides an opportunity to communicate with students when providing feedback.	3.67 (1.26)	0.67	0.83	**(modified)** When providing feedback, my instructor provides opportunities to exchange opinions between teachers and students regarding feedback.
	2	My instructor tries to lead students to understand the feedback through a continuous interaction between students and the teacher.	3.17 (0.98)	0.33	0.67	**(modified)** My instructor gives opportunities for students to fully express their opinions when providing feedback.
	3	My instructor provides feedback through a two-way communication rather than in one-way.	3.50 (1.17)	0.33	0.67	**(modified)** When providing feedback, my instructor tries to understand what students think about feedback.
	4	My instructor provides feedback and continuously checks students' opinions to lead students to participate.	3.67 (1.05)	0.67	0.83	**(modified)** To check whether students understand their feedback, my instructor provides an opportunity for questions.
	5	My instructor provides an opportunity to discuss the feedback by supplementing students' questions or thoughts.	3.50 (1.17)	0.67	0.83	**(modified)** My instructor provides opportunities to discuss students' thoughts on the feedback.
	6	When a student expresses his/her thoughts, my instructor restates the opinion to better describe the standpoint.	3.50 (1.41)	0.67	0.83	**(modified)** When providing feedback, my instructor restates in more detail what the student tries to say and asks if it represents student's opinion.
	7	My instructor repeats student's statements so that other students can follow.	3.50 (1.72)	0.67	0.83	**(modified)** When students express their opinions, My instructor holds a question time to provide an opportunity to organize and clarify their thoughts.
Timely feedback	1	My instructor returns the revised assignments/exams/answer sheets soon after they are submitted.	3.67 (1.26)	0.67	0.83	**(modified)** My instructor returns assignments/exams/answer sheets with feedback to students for revision very soon afterward.
	2	My instructor provides feedback right after returning the exams/answer sheets in class.	3.83 (1.22)	1.00	1.00	**(modified)** My instructor provides feedback very soon after holding exams or quizzes.

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Construct	Preliminary item (Round 2)		Content Validity			Pilot test item
			M(SD)	CVR	CVI	
	3	My instructor provides immediate feedback on students' statements or presentations in class.	4.33 (0.75)	1.00	1.00	**(modified)** My instructor provides feedback immediately after students' presentations or after students state their opinions in class.
	4	When students contact the teacher because they have questions, the teacher usually gives feedback within 1~2 days.	3.67 (1.03)	0.67	0.83	**(modified)** My instructor gives feedback soon after a student requests feedback on the assignment or exam.
	5	My instructor replies by offering advice in a relatively short time when students ask questions and explain their difficulties.	3.80 (1.22)	0.33	0.80	**(modified)** When students have questions or express difficulties regarding the learning content, my instructor replies or advises within a relatively short time.

<Table 21> Round 2 of content validity for 'feedback outcome'

Construct	Preliminary item (Round 2)		Content Validity			Pilot test item
			M(SD)	CVR	CVI	
Understanding	1	Feedback helped me to understand the lesson/learning content.	4.50 (1.47)	1.00	1.00	**(accepted)** Feedback helped me to understand the lesson/learning content.
	2	Feedback helped me in identifying the goal of the lesson/learning.	4.67 (1.17)	1.00	1.00	**(accepted)** Feedback helped me in identifying the goal of the lesson/learning.
	3	Feedback was helpful when studying for my exam, doing the task, and revising.	4.17 (0.75)	1.00	1.00	**(modified)** Feedback helped me in planning my study.
	4	Feedback helped me to understand why my answer was wrong.	4.17 (0.67)	0.67	0.83	**(deleted)**
	5	Feedback helped me to gain knowledge and information about my performance.	4.67 (0.52)	1.00	1.00	**(accepted)** Feedback helped me to gain knowledge and information about my performance.
	6	I used the feedback in my next assignment.	4.67 (1.55)	1.00	1.00	**(modified)** I think that I will use the feedback in my next assignment.
	7	I used the feedback in other	4.50	1.00	1.00	**(modified)** I think that I will use

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Construct	Preliminary item (Round 2)		Content Validity			Pilot test item
			M(SD)	CVR	CVI	
		subjects.	(1.10)			the feedback in other subjects.
	8	I applied the feedback in my exam.	3.50 (1.21)	0.33	0.67	**(deleted)**
	9	Through feedback, I was able to avoid repeating the same mistakes.	3.33 (1.17)	0.33	0.67	**(modified)** Through feedback, I believe that I won't repeat the same mistake.
Learning method	1	Through feedback, I got to know how to approach my learning.	4.67 (1.55)	1.00	1.00	**(accepted)** Through feedback, I got to know how to approach my learning.
	2	Feedback helped me to know effective learning/problem solving methods for the task or exams.	4.50 (1.10)	1.00	1.00	**(accepted)** Feedback helped me to know effective learning/problem solving methods for the task or exams.
	3	Through feedback, I was able to reduce time in solving the problem.	4.33 (0.89)	1.00	1.00	**(modified)** Feedback helped me to prepare for the exam effectively.
	4	Feedback helped me in preparing for my assignment/presentation.	4.33 (1.17)	0.67	0.83	**(modified)** Feedback helped me to prepare for my assignment/class activity/presentation.
	5	I thought of the feedback before starting my assignment.	4.17 (0.84)	1.00	1.00	**(modified)** When doing my assignment, I thought of the feedback that my instructor provided.
Self-reflection	1	Feedback helped me to understand what I already knew and didn't know.	4.83 (1.60)	1.00	1.00	**(accepted)** Feedback helped me to understand what I already knew and didn't know.
	2	Through feedback, I was able to check if I was missing something.	4.17 (1.03)	1.00	1.00	**(modified)** Through feedback, I checked whether there was anything I missed or forgot in my assignment.
	3	Feedback made me think about my action once more.	4.33 (1.26)	0.67	0.83	**(accepted)** Feedback made me think about my action once more.
	4	Through feedback, I started to look at myself objectively.	4.50 (0.82)	1.00	1.00	**(accepted)** Through feedback, I started to look at myself objectively.
	5	Through feedback, I started to see what my strengths and weaknesses are.	4.00 (1.26)	0.67	0.83	**(accepted)** Through feedback, I started to see what my strengths and weaknesses are.
	6	Through feedback, I started to check on whether my writing or thought was	3.67 (1.47)	0.67	0.83	**(modified)** Through feedback, I started to reflect on my writing and thoughts.

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Construct	Preliminary item (Round 2)		Content Validity			Pilot test item
			M(SD)	CVR	CVI	
		logical.				
Effort	1	After receiving feedback, I started to pay more attention to the class.	4.00 (1.51)	0.67	0.83	**(accepted)** After receiving feedback, I started to pay more attention to the class.
	2	After receiving feedback, I started to engage more in the class.	4.33 (1.17)	1.00	1.00	**(modified)** After receiving feedback, I became more engaged in the class.
	3	After receiving feedback, I put in effort until the end to improve on what was lacking in my assignment.	4.67 (0.82)	1.00	1.00	**(modified)** After receiving feedback, I put an effort into improving on what was lacking in my assignment.
	4	After receiving feedback, I put an effort into finishing my assignment even if I didn't like the task or if the task was difficult for me.	4.50 (0.52)	1.00	1.00	**(accepted)** After receiving feedback, I put an effort into finishing my assignment even if I didn't like the task or if the task was difficult for me.
	5	After receiving feedback, I put an effort into applying the feedback in my performance/assignment.	4.33 (1.21)	0.67	0.83	**(modified)** After receiving feedback, I put an effort into applying the feedback in my subsequent performance/assignment.
Help-seeking	1	After receiving feedback, it was easier to ask my instructor for help again.	4.17 (1.64)	0.67	0.83	**(modified)** After receiving feedback, it was easier to ask my instructor for help.
	2	After receiving feedback, I started to ask more questions in class.	3.50 (0.89)	0.67	0.83	**(modified)** After receiving feedback, I started asking more questions in class.
	3	I started to contact or ask my instructor directly for a meeting to receive some feedback.	3.17 (0.89)	0.33	0.67	**(modified)** After receiving feedback, I started to request face to face meetings when I needed help regarding class activities/assignments.
	4	After receiving feedback, I started searching for materials relating to the class.	3.17 (1.21)	0.67	0.83	**(modified)** After receiving feedback, I asked my instructor about learning materials or an effective approach to the assignment.
	5	After receiving feedback, I became more actively engaged in requesting face to face meetings when I didn't understand the feedback.	4.33 (1.21)	0.67	0.83	**(modified)** I asked my instructor when I did not understand the feedback.

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Construct	Preliminary item (Round 2)		Content Validity			Pilot test item
			M(SD)	CVR	CVI	
Autonomous motivation	1	Through feedback, my interest in the subject has been enhanced.	4.17 (1.64)	0.67	0.83	**(accepted)** Feedback enhanced my interest for the subject.
	2	Feedback led me to become interested in the field related to the subject.	4.50 (1.10)	1.00	1.00	**(accepted)** Feedback enhanced my interest in the field related to the subject.
	3	Feedback made me realize the importance of the class for my learning and growth	4.50 (0.75)	1.00	1.00	**(modified)** Feedback made me realize the importance of the class.
	4	Feedback induced active class participation.	3.00 (1.21)	0.00	0.50	**(modified)** Feedback made me want to actively participate in class.
	5	Feedback motivated me to work harder.	3.83 (1.17)	0.67	0.83	**(modified)** Through feedback, I enjoyed participating in class activities and doing the assignments.
Self-efficacy/ confidence	1	Feedback made me feel confident about my abilities.	3.50 (1.17)	0.67	0.83	**(modified)** The feedback made me think more positively about my abilities.
	2	Through feedback, I gained confidence in other subjects, too.	4.50 (1.10)	1.00	1.00	**(accepted)** Through feedback, I gained confidence in other subjects, too.
	3	Through feedback, my confidence for the assignment/presentation/exam has increased.	4.50 (0.75)	1.00	1.00	**(accepted)** Through feedback, my confidence for the assignment/presentation/exam has increased.
	4	After receiving feedback, I gained confidence in doing problem solving tasks.	4.50 (0.75)	1.00	1.00	**(accepted)** After receiving feedback, I gained confidence in doing problem solving tasks.
	5	Through feedback, I felt confident about being able to solve the problem.	4.50 (0.52)	1.00	1.00	**(accepted)** Through feedback, I felt confident that I will about being able to solve the problem.

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4.2.1.3. Readability Check

An examination of readability of the items was conducted with two undergraduate students whether the items were sufficiently worded and phrased for undergraduate students. The researcher requested to provide feedback if there were any ambiguous words they could not understand. As a result, the students expressed that the items were appropriately written.

4.2.1.4. Items of 'Characteristics of Effective Feedback' for Pilot Test

After two round of expert judgment, a total of 30 items were derived representing the constructs of 'characteristics of effective feedback' which was conceptualized through an extant literature review and the responses of the open-ended survey (<Table 22>).

<Table 22> Items for 'characteristics of effective feedback'

Construct		Item
Detailed Feedback	1	My instructor provides detailed feedback on what was done well and what needed to be improved. 교수님은 학생의 과제나 활동, 발표에 대해서 잘한 점/부족한 점을 구체적으로 피드백을 해주신다.
	2	My instructor explains in detail what has been appropriate and what was not. 교수님은 학생의 과제나 활동, 발표에 대해서 어떤 부분이 적절하고 부적절한지 그 이유를 구체적으로 설명해 주신다.
	3	My instructor explains in detail the evidence for the given marks or grades. 교수님은 학생의 과제나 활동, 발표에 대해서 평가 점수나 성적에 관련한 근거를 구체적으로 제공해 주신다.
	4	My instructor provides detailed feedback to the assignments or performance by showing detailed examples. 교수님은 학생의 과제나 활동, 발표에 대해서 학생의 과제나 활동에 구체적인 예시를 보여주시면서 피드백을 제공해 주신다.

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Construct		Item
	5	My instructor explains in detail how to find the ideal answer. 교수님은 학생의 과제나 활동, 발표에 대해서 정답에 이르는 과정에 대해 학생에게 구체적으로 설명해 주신다.
	6	My instructor gives a specific direction on how to revise the assignment. 교수님은 학생의 과제나 활동, 발표에 대해서 과제를 어떻게 수정해야 하는지에 대한 방향을 구체적으로 알려주신다.
	7	My instructor informs in detail whether the assignment fits the expected format and draft. 교수님은 학생의 과제나 활동, 발표에 대해서 나의 과제가 교수님께서 원하시는 과제의 형식과 틀에 부합한지에 대해서 구체적으로 알려주신다.
Giding feedback	1	My instructor provides clues (prompts) in class or assignments, to help students in finding the answer on their own. 교수님은 수업 활동이나 과제에서 학생이 스스로 해결책을 찾을 수 있도록 단서(실마리)를 제공해 주신다.
	2	My instructor provides hints so that the students can find out by themselves if the answer is right or wrong. 교수님은 학생이 무엇이 맞고 틀렸는지를 스스로 찾을 수 있도록 힌트를 제공해 주신다.
	3	My instructor provides questions about the learning content or problem so that the students can revise the performance or task by their own. 교수님은 학생이 활동/과제를 스스로 개선할 수 있도록 문제 또는 학습내용에 대해 질문하신다.
	4	My instructor requests to clarify students' thoughts so that the student can improve on his/her own. 교수님은 학생이 활동/과제를 스스로 개선할 수 있도록 학생의 생각에 대해 더 자세히 설명해 볼 것을 요청하신다.
	5	My instructor suggests a rough direction about how the performance/assignment should be revised, but he/she lets students find specific ways of doing it. 교수님은 활동/과제를 수정하는 대략적인 방향을 제시해주시면서 구체적인 방법은 학생이 스스로 고민하게 하신다.
Acknow-ledging feedback	1	My instructor praises and acknowledges students' process of improvement to encourage the efforts given. 교수님은 학생의 과제나 활동, 발표에 대해서 학생의 노력을 격려하기 위해 수행 및 발전과정에 대해 인정/칭찬해 주신다.
	2	My instructor acknowledges students' thoughts and provided feedback in a thoughtful tone. 교수님은 학생의 과제나 활동, 발표에서 학생의 생각을 인정해주면서 사려깊은 어조로 피드백해주신다.

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Construct		Item
	3	Instead of criticizing me, my instructor provides feedback in an encouraging way. 교수님은 학생의 과제나 활동, 발표에서 틀린 답이어도 혼내지 않고 격려하는 방식으로 피드백해주신다.
	4	When pointing out areas for improvement, my instructor also acknowledges the strengths of the student. 교수님은 학생의 과제나 활동, 발표에서 부족한 부분을 지적하면서도 학생의 장점도 함께 인정해주신다.
	5	My instructor gives supportive messages to students. 교수님은 학생의 과제나 활동, 발표에 대해서 학생을 응원하는 메시지를 전해주신다.
	6	My instructor provides feedback in an suggestive manner considering students' feelings. 교수님은 학생의 과제나 활동, 발표에 대해서 학생의 감정을 고려하면서 피드백을 제공해 주신다.
Interactive feedback	1	When providing feedback, my instructor provides opportunities to exchange opinions between teachers and students regarding feedback. 교수님은 피드백에 대해 학생들과 의견을 주고받을 수 있는 기회를 제공해 주신다.
	2	My instructor gives opportunities for students to fully express their opinions when providing feedback. 교수님은 피드백을 제공하실 때 학생이 의견을 충분히 말할 수 있도록 기회를 제공해 주신다.
	3	When providing feedback, my instructor tries to understand what students think about feedback. 교수님은 피드백을 제공하실 때 피드백에 대한 학생의 의견을 파악하고자 하신다.
	4	To check whether students understand their feedback, my instructor provides an opportunity for questions. 교수님은 피드백 제공 후 학생의 피드백에 대한 이해정도를 확인하기 위해 질의응답의 기회를 제공해 주신다.
	5	My instructor provides opportunities to discuss students' thoughts on the feedback. 교수님은 피드백에 대한 학생의 생각을 확인하기 위해 논의할 기회를 주신다.
	6	When providing feedback, my instructor restates in more detail what the student tries to say and asks if it represents student's opinion. 교수님은 피드백을 제공하실 때 학생이 말하고자 하는 의미를 더욱 자세히 드러날 수 있도록 다시 진술해 주시고 학생의 의견을 구하신다.

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Construct		Item
	7	When students express their opinions, My instructor holds a question time to provide an opportunity to organize and clarify their thoughts. 교수님은 학생이 발언을 할 때 질의/응답을 통해 학생의 생각이 명확해지도록 하신다.
Timely feedback	1	My instructor returns assignments/exams/answer sheets with feedback to students for revision very soon afterward. 교수님은 피드백 코멘트가 적힌 과제물/시험지/답안지를 빠른 시일 내에 확인할 수 있게 하신다.
	2	My instructor provides feedback very soon after holding exams or quizzes. 교수님은 시험/퀴즈를 마친 뒤 빠른 시일 내에 수업에서 시험/퀴즈에 관해 피드백을 주신다.
	3	My instructor provides feedback immediately after students' presentations or after students state their opinions in class. 교수님은 수업에서 학생의 발언이나 발표에 대해 즉각적으로 피드백을 제공해 주신다.
	4	My instructor gives feedback soon after a student requests feedback on the assignment or exam. 교수님은 학생이 과제나 시험에 대한 피드백을 요청하면 교수님은 빠른 시일 내에 피드백을 제공해 주신다.
	5	When students have questions or express difficulties regarding the learning content, my instructor replies or advises within a relatively short time. 교수님은 학생이 학습내용에 대한 질문이 있거나 어려움이 있을 때 비교적 빠른 시일 내에 답변이나 조언을 해주신다.

4.2.1.5. Items of 'Feedback Outcome' for Pilot Test

In total, 38 items were derived representing the constructs of 'feedback outcome' which was developed through the literature review and the responses of the open-ended survey (<Table 23>).

<Table 23> Items of 'feedback outcome'

Construct		Item
Under-standing	1	Feedback helped me to understand the lesson/learning content. 교수님의 피드백은 수업/학습내용을 이해하는 데에 도움이 되었다.

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Construct		Item
	2	Feedback helped me in identifying the goal of the lesson/learning. 교수님의 피드백은 수업/학습의 목표를 파악하는 데에 도움이 되었다.
	3	Feedback helped me in planning my study. 교수님의 피드백은 공부할 때 학습계획을 수립하는 데에 도움이 되었다.
	4	Feedback helped me to gain knowledge and information about my performance. 교수님의 피드백을 통해 내 수행에 필요한 지식과 정보를 알게 되었다.
	5	I think that I will use the feedback in my next assignment. 다음 과제를 할 때 교수님이 제공해 주신 피드백을 활용할 수 있을 것 같다.
	6	I think that I will use the feedback in other subjects. 다른 과목에서도 교수님이 제공해 주신 피드백을 활용할 수 있을 것 같다.
	7	Through feedback, I believe that I won't repeat the same mistake. 교수님이 제공해 주신 피드백을 통해 같은 실수를 반복하지 않을 것 같다.
Learning method	1	Through feedback, I got to know how to approach my learning. 교수님의 피드백을 통해 내가 어떻게 공부해야 하는지 알 수 있었다.
	2	Feedback helped me to know effective learning/problem solving methods for the task or exams. 교수님의 피드백을 통해 효율적인 학습/문제해결 방법(과제, 시험)을 터득하는 데 도움이 되었다.
	3	Feedback helped me to prepare for the exam effectively. 교수님의 피드백을 통해 시험을 효과적으로 준비하는 데에 도움이 되었다.
	4	Feedback helped me to prepare for my assignment/class activity/presentation. 과제를 수행할 때 교수님이 이전에 주신 피드백을 떠올려보게 되었다.
	5	When doing my assignment, I thought of the feedback that my instructor provided. 교수님의 피드백은 과제/수업활동/발표를 준비하는 데 도움이 되었다.
Self-reflection	1	Feedback helped me to understand what I already knew and didn't know. 교수님의 피드백을 통해 내가 무엇을 알고 모르는지 확인하게 되었다.

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Construct		Item
	2	Through feedback, I checked whether there was anything I missed or forgot in my assignment. 교수님의 피드백을 통해 나의 수행에 대해서 다시 생각하게 되었다.
	3	Feedback made me think about my action once more. 교수님의 피드백을 통해 과제에서 내가 놓치거나 빼놓은 부분이 없는지 점검하게 되었다.
	4	Through feedback, I started to look at myself objectively. 교수님의 피드백을 통해 나 스스로를 더 객관적으로 바라보게 되었다.
	5	Through feedback, I started to see what my strengths and weaknesses are. 교수님의 피드백을 통해 나의 강점과 약점이 무엇인지 파악하게 되었다.
	6	Through feedback, I started to reflect on my writing and thoughts. 교수님의 피드백을 통해 나의 글이나 생각에 대해 성찰하게 되었다.
Effort	1	After receiving feedback, I started to pay more attention to the class. 교수님의 피드백을 받은 이후로 나는 수업에 더욱 집중하게 되었다.
	2	After receiving feedback, I became more engaged in the class. 교수님의 피드백을 받은 이후로 나는 수업을 더욱 열심히 하게 되었다.
	3	After receiving feedback, I put an effort to improve on what was lacking in my assignment. 교수님의 피드백을 받은 이후로 과제의 부족한 점을 고쳐나가고자 노력하였다.
	4	After receiving feedback, I put an effort into finishing my assignment even if I didn't like the task or if the task was difficult for me. 교수님의 피드백을 받은 이후로 과제가 어렵거나 내가 좋아하지 않는 과제여도 끝까지 수행하고자 노력하였다.
	5	After receiving feedback, I put an effort into applying the feedback in my subsequent performance/assignment. 나는 이후의 수행이나 과제에 교수님의 피드백을 반영하고자 노력하였다.
Help-seeking	1	After receiving feedback, it was easier to ask my instructor for help. 교수님의 피드백을 받은 후에 교수님에게 도움을 요청하는 것이 수월해졌다.
	2	After receiving feedback, I started asking more questions in class. 교수님의 피드백을 받은 후에 수업에서 더 많은 질문을 하게 되었다.

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Construct		Item
	3	After receiving feedback, I started to request a face to face meeting when I needed help regarding class activities/assignments. 교수님의 피드백을 받은 후에 활동/과제 수행과정에서 교수님의 도움이 필요할 때 면담을 요청하게 되었다.
	4	After receiving feedback, I asked my instructor about learning materials or an effective approach to the assignment. 교수님의 피드백을 받은 후에 필요한 자료나 과제 수행방법에 대해 교수님께 문의하게 되었다.
	5	I asked my instructor when I did not understand the feedback. 교수님의 피드백이 이해가 안 되었을 경우에 교수님에게 물어보게 되었다.
Autonomous motivation	1	Feedback enhanced my interest for the subject. 교수님의 피드백은 과목에 대한 흥미와 관심을 가지도록 이끌어주었다.
	2	Feedback enhanced my interest in the field related to the subject. 교수님의 피드백은 수업과 관련된 분야에 대해 흥미를 갖게 하였다.
	3	Feedback made me realize the importance of the class. 교수님의 피드백 덕분에 이 수업이 더 중요하게 느껴졌다.
	4	Feedback made me want to actively participate in class. 교수님의 피드백 덕분에 수업에 더 적극적으로 참여하고 싶은 마음이 생겼다.
	5	Through feedback, I enjoyed participating in class activities and doing the assignments. 교수님의 피드백으로 인해 수업활동/과제를 하는 게 즐거워졌다.
Self-efficacy / confidence	1	Feedback made me think more positively about my abilities. 교수님의 피드백을 통해 내 능력에 대해 긍정적으로 생각하게 되었다.
	2	Through feedback, I gained confidence in other subjects, too. 교수님의 피드백으로 인해 다른 과목에서도 자신감이 생겼다.
	3	Through feedback, my confidence for the assignment/presentation/exam has increased. 교수님의 피드백을 통해 과제/발표/시험에 대한 자신감이 높아졌다.
	4	After receiving feedback, I gained confidence in doing problem solving tasks. 교수님의 피드백을 받은 후 문제를 풀 때 자신감이 생겼다.
	5	Through feedback, I felt confident that I will be able to solve the problem. 교수님의 피드백을 통해 내가 문제를 잘 해결할 수 있을 것이라는 확신이 생겼다.

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4.2.2. Selection of the Items for Final Instrument

For the purpose of selecting the final items of EFI, the reliability test and the Exploratory Factor Analysis (EFA) were conducted.

In testing for normality of data distribution, this research used the recommended criteria by Chou and Bentler (1995), suggesting that items with a skewness greater than 3.0 as being considered extreme. The 30 items of ‘characteristics of effective feedback’ and 38 items of ‘feedback outcome’ were significantly skewed and all kurtosis values had lower than the cutoff value of 3.0 meaning that the normal distribution was satisfied.

4.2.3. Reliability

Item total statistics was performed to determine the reliability of the items for ‘characteristics of effective feedback’ (<Table 24>). The corrected item-total correlation was examined to identify the items that were less reliable and needed to be removed from EFI. The correlations were all >0.4, meaning that no variables with poor correlations were shown. Thus, no items were primarily removed.

<Table 24> Item total statistics of EFI ‘effective feedback’

Measure	No	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Detailed feedback	1	101.29	132.171	.621	.958	.959
	2	101.23	133.042	.569	.958	
	3	101.38	132.460	.559	.958	
	4	101.31	133.543	.536	.958	
	5	101.32	131.972	.674	.957	
	6	101.46	129.946	.661	.958	
	7	101.54	128.936	.731	.957	
Guiding feedback	1	101.38	131.854	.724	.957	
	2	101.42	131.233	.679	.957	
	3	101.29	132.671	.626	.958	

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Measure	No	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
	4	101.35	131.492	.658	.957	
	5	101.33	132.062	.658	.957	
Acknowledging feedback	1	101.24	132.212	.697	.957	
	2	101.21	132.818	.662	.957	
	3	101.15	133.474	.645	.958	
	4	101.29	131.306	.737	.957	
	5	101.27	132.430	.610	.958	
	6	101.29	131.270	.722	.957	
Interactive feedback	1	101.41	130.625	.701	.957	
	2	101.31	131.426	.709	.957	
	3	101.30	131.389	.688	.957	
	4	101.30	131.641	.684	.957	
	5	101.46	130.762	.644	.958	
	6	101.32	131.628	.677	.957	
	7	101.35	131.665	.683	.957	
Timely feedback	1	101.48	131.695	.565	.958	
	2	101.42	133.024	.494	.959	
	3	101.24	133.295	.614	.958	
	4	101.24	132.812	.655	.958	
	5	101.19	133.043	.669	.957	

Item total statistics was performed to determine the validity of the items of 'feedback outcome' (<Table 25>). The corrected item-total correlation was examined to identify the items that were less reliable and needed to be removed from EFI. The correlations were all >0.4, meaning that no variables with poor correlations were shown. Thus, no items were removed.

<Table 25> Item total statistics of EFI 'feedback outcome'

Construct	No	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Understanding	1	123.52	324.799	.696	.975	.975
	2	123.53	323.066	.710	.974	
	3	123.64	321.018	.730	.974	
	4	123.52	324.258	.660	.975	
	5	123.53	325.485	.626	.975	
	6	123.72	320.977	.686	.975	
	7	123.72	322.295	.666	.975	

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Construct	No	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Learning method	1	123.75	318.924	.739	.974	
	2	123.65	321.180	.723	.974	
	3	123.62	321.486	.730	.974	
	4	123.71	323.220	.661	.975	
	5	123.62	323.232	.701	.975	
Self-reflection	1	123.65	322.705	.680	.975	
	2	123.66	322.291	.725	.974	
	3	123.63	322.719	.664	.975	
	4	123.79	318.760	.749	.974	
	5	123.89	318.977	.673	.975	
	6	123.73	321.842	.663	.975	
Effort	1	123.72	319.197	.773	.974	
	2	123.69	319.318	.763	.974	
	3	123.64	321.756	.725	.974	
	4	123.77	319.535	.669	.975	
	5	123.61	322.254	.709	.974	
Help-seeking	1	123.83	315.417	.796	.974	
	2	124.21	315.761	.666	.975	
	3	124.33	316.568	.631	.975	
	4	124.18	314.213	.701	.975	
	5	124.06	316.307	.688	.975	
Autonomous motivation	1	123.71	320.754	.743	.974	
	2	123.69	319.897	.772	.974	
	3	123.72	319.919	.748	.974	
	4	123.71	318.368	.779	.974	
	5	124.00	315.913	.720	.974	
Self-efficacy / confidence	1	123.77	319.918	.719	.974	
	2	123.97	316.472	.732	.974	
	3	124.04	317.655	.752	.974	
	4	123.95	317.878	.739	.974	
	5	123.91	317.988	.756	.974	

4.2.3.1. Exploratory Factor Analysis

Exploratory Factor Analysis was conducted using SPSS to ensure the primary factor structure of EFI was evident. The principal-components analysis was performed through the oblique rotation with kaiser normalization. The oblique rotation is recommended in social science since factor inter-correlations are acceptable (Costello & Osborne, 2005).

The Kaiser's Meyer Olkin measure of sampling adequacy was .944 for 'characteristics

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of effective feedback' and .955 for 'feedback outcome', showing that the patterns of correlations were compact so that a factor analysis could yield reliable factors (Field, 2000). The Bartlett's test of sphericity gave a p-value of .000 for both scales, showing that relationships between the variables were existing.

For 'characteristics of effective feedback', a 5-factor was enforced, accounting for 67.162% of the total value. Factor loadings are shown in <Table 26>. Items were examined by their communalities, factor-loadings, and review of the items. Communality values of <.40 indicate that these variables should not be retained (Watson, 2017). Thus, items with a communality value less than .40 were eliminated, which were the following items: 'Detailed3', 'Acknowledging3', and 'Acknowledging5'.

As the table shows, the factor loadings were relatively high, ranging from -.728 to .891. Four items with the highest loadings were selected from each construct that best represented each factor. Items that had redundant contents were not selected even if the factor loading was high. Through this process, 20 items were retained.

<Table 26> Exploratory factor analysis of EFI 'characteristics of effective feedback'

Item	Factor1	Factor2	Factor3	Factor4	Factor5
Interactive6	.808				
Interactive2	.802				
Interactive4	.800				
Interactive5	.743				
Interactive1	.730				
Interactive7	.720				
Interactive3	.705				
Detailed1		.891			
Detailed2		.859			
Detailed6		.710			
Detailed7		.677			
Timely1			.827		
Timely2			.820		
Timely4			.720		
Timely5			.646		
Acknowledging1				-.851	
Acknowledging6				-.818	
Acknowledging4				-.791	
Acknowledging2				-.778	

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Item	Factor1	Factor2	Factor3	Factor4	Factor5
Guiding4					-.800
Guiding2					-.764
Guiding3					-.759
Guiding5					-.728
Guiding1					-.714
Timely3					-.631

For ‘feedback outcome’, the number of factors was determined by factor eigenvalues above 1.0. Four-factor solution was produced respectively. Item loadings on the factor solution accounted for 69.867% of item variance. These factor loadings are presented in <Table 27>. Items of ‘Learning method4’, ‘Self-reflection3’ were removed because the communality value was less than .40.

As the table shows, all loadings were relatively high, ranging from -.775 to .881. Among the 25 items, ‘Learning method’ was not related well to the factors.

Four items with the highest loadings were selected from each construct that best represented each factor. Items that had redundant contents were dropped even if the factor showed high loadings. Through this process, 16 items were retained.

<Table 27> Exploratory factor analysis of EFI ‘feedback outcome’

Item	Factor1	Factor2	Factor3	Factor4
Understanding2	.881			
Understanding4	.835			
Understanding1	.826			
Understanding5	.801			
Understanding3	.800			
Learning method2	.751			
Learning method5	.720			
Help-seeking4		.914		
Help-seeking5		.897		
Help-seeking3		.891		
Help-seeking2		.764		
Help-seeking1		.760		

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Item	Factor1	Factor2	Factor3	Factor4
Self-reflection4			-.846	
Self-reflection5			-.796	
Self-reflection2			-.794	
Self-reflection1			-.775	
Learning method3			-.746	
Self-reflection3			-.744	
Self-reflection6			-.713	
Learning method1			-.708	
Self-efficacy1				-.874
Autonomous motivation5				-.852
Autonomous motivation4				-.807
Self-efficacy2				-.806
Autonomous motivation3				-.763

4.2.4. Items for Final Instrument

After examining the Exploratory Factor Analysis (EFA), a total of 20 items were derived representing the constructs of ‘characteristics of effective feedback’ (<Table 28>).

<Table 28> Items for the final instrument of ‘characteristics of effective feedback’

Construct		Item
Detailed Feedback	1	My instructor provides detailed feedback on what was done well and what needed to be improved. 교수님은 학생의 과제나 활동, 발표에 대해서 잘한 점/부족한 점을 구체적으로 피드백해주신다.
	2	My instructor explains in detail what has been appropriate and what was not. 교수님은 학생의 과제나 활동, 발표에 대해서 어떤 부분이 적절하고 부적절한지 그 이유를 구체적으로 설명해 주신다.
	3	My instructor gives a specific direction on how to revise the assignment. 교수님은 학생의 과제나 활동, 발표에 대해서 과제를 어떻게 수정해야 하는지에 대한

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Construct		Item
		방향을 구체적으로 알려주신다.
	4	My instructor informs in detail whether the assignment fits the expected format and draft. 교수님은 학생의 과제나 활동, 발표에 대해서 나의 과제가 교수님께서 원하시는 과제의 형식과 틀에 부합한지에 대해서 구체적으로 알려주신다.
Guiding feedback	1	My instructor requests to clarify students' thoughts so that the student can improve on his/her own. 교수님은 학생이 활동/과제를 스스로 개선할 수 있도록 학생의 생각에 대해 더 자세히 설명해 볼 것을 요청하신다.
	2	My instructor provides questions about the learning content or problem so that the students can revise the performance or task by their own. 교수님은 학생이 활동/과제를 스스로 개선할 수 있도록 문제 또는 학습내용에 대해 질문하신다.
	3	My instructor provides hints so that the students can find out by themselves if the answer is right or wrong. 교수님은 학생이 무엇이 맞고 틀렸는지를 스스로 찾을 수 있도록 힌트를 제공해 주신다.
	4	My instructor suggests a rough direction about how the performance/assignment should be revised, but he/she lets students find specific ways of doing it. 교수님은 활동/과제를 수정하는 대략적인 방향을 제시해주시면서 구체적인 방법은 학생이 스스로 고민하게 하신다.
Acknow-ledging feedback	1	My instructor praises and acknowledges students' process of improvement to encourage the efforts given. 교수님은 학생의 과제나 활동, 발표에 대해서 학생의 노력을 격려하기 위해 수행 및 발전과정에 대해 인정/칭찬해 주신다.
	2	My instructor gives supportive messages to students. 교수님은 학생의 과제나 활동, 발표에 대해서 학생을 응원하는 메시지를 전해주신다.
	3	My instructor acknowledges students' thoughts and provided feedback in a thoughtful tone. 교수님은 학생의 과제나 활동, 발표에서 학생의 생각을 인정해주면서 사려깊은 어조로 피드백해주신다.
	4	When pointing out areas for improvement, my instructor also acknowledges the strengths of the student. 교수님은 학생의 과제나 활동, 발표에서 부족한 부분을 지적하면서도 학생의 장점도 함께 인정해주신다.
Interactive feedback	1	When providing feedback, my instructor restates in more detail what the student tries to say and asks if it represents student's opinion. 교수님은 피드백을 제공하실 때 학생이 말하고자 하는 의미를 더욱 자세히 드러날 수 있도록 다시 진술해 주시고 학생의 의견을 구하신다.
	2	My instructor gives opportunities for students to fully express their opinions when providing feedback. 교수님은 피드백을 제공하실 때 학생이 의견을 충분히 말할 수 있도록 기회를 제공해 주신다.

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Construct		Item
	3	To check whether students understand their feedback, my instructor provides an opportunity for questions. 교수님은 피드백 제공 후 학생의 피드백에 대한 이해정도를 확인하기 위해 질의응답의 기회를 제공해 주신다.
	4	My instructor provides opportunities to discuss students' thoughts on the feedback. 교수님은 피드백에 대한 학생의 생각을 확인하기 위해 논의할 기회를 주신다.
Timely feedback	1	My instructor returns assignments/exams/answer sheets with feedback to students for revision very soon afterward. 교수님은 피드백 코멘트가 적힌 과제물/시험지/답안지를 빠른 시일 내에 확인할 수 있게 하신다.
	2	When students have questions or express difficulties regarding the learning content, my instructor replies or advises within a relatively short time. 교수님은 학생이 학습내용에 대한 질문이 있거나 어려움이 있을 때 비교적 빠른 시일 내에 답변이나 조언을 해주신다.
	3	My instructor gives feedback soon after a student requests feedback on the assignment or exam. 교수님은 학생이 과제나 시험에 대한 피드백을 요청하면 교수님은 빠른 시일 내에 피드백을 제공해 주신다.
	4	My instructor provides feedback very soon after holding exams or quizzes. 교수님은 시험/퀴즈를 마친 뒤 빠른 시일 내에 수업에서 시험/퀴즈에 관해 피드백을 주신다.

After examining the Exploratory Factor Analysis (EFA), a total of 16 items were derived representing the constructs of 'feedback outcome' (<Table 29>).

<Table 29> Items of 'feedback outcome'

Construct		Item
Under-standing	1	Feedback helped me in identifying the goal of the lesson/learning. 교수님의 피드백은 수업/학습의 목표를 파악하는 데에 도움이 되었다.
	2	Feedback helped me to gain knowledge and information about my performance. 교수님의 피드백을 통해 내 수행에 필요한 지식과 정보를 알게 되었다.
	3	Feedback helped me to know effective learning/problem solving methods for the task or exams. 교수님의 피드백을 통해 효율적인 학습/문제해결 방법(과제, 시험)을 터득하는 데 도움이 되었다.

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Construct		Item
	4	When doing my assignment, I thought of the feedback that my instructor provided. 교수님의 피드백은 과제/수업활동/발표를 준비하는 데 도움이 되었다.
Self-reflection	1	Through feedback, I started to look at myself objectively. 교수님의 피드백을 통해 나 스스로를 더 객관적으로 바라보게 되었다.
	2	Through feedback, I started to see what my strengths and weaknesses are. 교수님의 피드백을 통해 나의 강점과 약점이 무엇인지 파악하게 되었다.
	3	Through feedback, I checked whether there was anything I missed or forgot in my assignment. 교수님의 피드백을 통해 나의 수행에 대해서 다시 생각하게 되었다.
	4	Feedback helped me to understand what I already knew and didn't know. 교수님의 피드백을 통해 내가 무엇을 알고 모르는지 확인하게 되었다.
Help-seeking	1	After receiving feedback, I asked my instructor about learning materials or an effective approach to the assignment. 교수님의 피드백을 받은 후에 필요한 자료나 과제 수행방법에 대해 교수님께 문의하게 되었다.
	2	I asked my instructor when I did not understand the feedback. 교수님의 피드백이 이해가 안 되었을 경우에 교수님에게 물어보게 되었다.
	3	After receiving feedback, I started to request a face to face meeting when I needed help regarding class activities/assignments. 교수님의 피드백을 받은 후에 활동/과제 수행과정에서 교수님의 도움이 필요할 때 면담을 요청하게 되었다.
	4	After receiving feedback, I started asking more questions in class. 교수님의 피드백을 받은 후에 수업에서 더 많은 질문을 하게 되었다.
Self-efficacy / confidence	1	Feedback made me think more positively about my abilities. 교수님의 피드백을 통해 내 능력에 대해 긍정적으로 생각하게 되었다.
	2	Through feedback, I enjoyed participating in class activities and doing the assignments. 교수님의 피드백으로 인해 수업활동/과제를 하는 게 즐거워졌다.
	3	Feedback made me want to actively participate in class. 교수님의 피드백 덕분에 수업에 더 적극적으로 참여하고 싶은 마음이 생겼다.
	4	Through feedback, I gained confidence in other subjects, too. 교수님의 피드백으로 인해 다른 과목에서도 자신감이 생겼다.

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4.3. Validation of Final Instrument of EFI

With the development of any instrument, an examination of the validity is required to investigate whether the instrument is measuring what it is supposed to measure (DeVellis, 2017). The validation process of EFI was conducted involving 1) construct validity, 2) convergent and divergent validity, and 3) concurrent validity. The construct validity is a unifying form of validity for psychological measurements (Strauss & Smith, 2009). Convergent validity is achieved when a variable correlates with other measures of similar constructs, whereas for divergent validity, low correlation between the variable with other measures that are not measuring the same construct (Bookter, 1999). The concurrent validity measures how well a new instrument correlates with to the measurement scores of other instruments (Dunlow et al., 2007), through high correlations, the instrument can be viewed as valid.

4.3.1. Construct Validity

To establish the construct validity, Confirmatory Factor Analysis was conducted to validate the factor structure derived from the Exploratory Factor Analysis (EFA).

4.3.1.1. Confirmatory Factor Analysis of EFI 'Characteristics of Effective Feedback'

Findings of the CFA revealed that the 5-factor model for EFI showed a good fit of the data. The model fit indices revealed a result of RMSEA index of .059. RMSEA values of less than .06 indicate a good fit, whereas values as high as .08 indicate a reasonable fit (Hu & Bentler, 1998). Thus, the RMSEA for the 'characteristics of effective feedback' showed an adequate to good value. Another fit indices that was used to assess the model fit was the CFI which showed a value of .973. According to Hu and Bentler (1999), a CFI above .95 is generally seen as a good fit. The criterion

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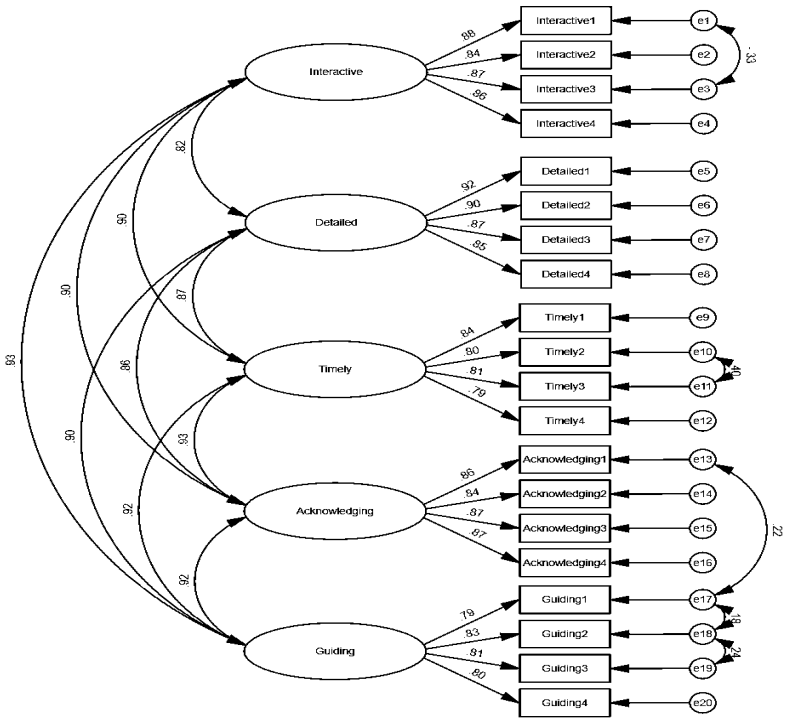
for TLI should be >.95 (Radwin & Cabral, 2009). The TLI for this research revealed a value of .966, indicating a good model fit. The model fit indices are shown in <Table 30>. The chi-square test was significant, x^2=438.143(df= 155), p<.001, indicating that the 5-factor represented a good factor structure.

<Table 30> Model fit of EFI ‘characteristics of effective feedback’

Model	X^2	df	RMSEA	CFI	TLI
5-factor	438.143	155	.059	.973	.966

*** p < .001



[Figure 2] Result of Confirmatory Factor Analysis of EFI ‘characteristics of effective feedback’

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The standardized factor loadings were examined, and the results are shown in <Table 31>. The reliability coefficients of each sub-scale demonstrated well between .89~.94.

All items showed significant values of standardized factor loadings ranging from .79~.92.

<Table 31> Confirmatory factor analysis of EFI ‘characteristics of effective feedback’

Construct	Item	Factor Loading	*S.E.*	*P*	Cronbach’s alpha
Interactive Feedback	Interactive1	.88	-	-	.92
	Interactive2	.84	.03	.000	
	Interactive3	.87	.04	.000	
	Interactive4	.86	.04	.000	
Detailed Feedback	Detailed1	.92	-	-	.94
	Detailed2	.90	.03	.000	
	Detailed3	.87	.03	.000	
	Detailed4	.85	.03	.000	
Timely Feedback	Timely1	.84	-	-	.90
	Timely2	.80	.03	.000	
	Timely3	.81	.03	.000	
	Timely4	.79	.04	.000	
Acknowleding Feedback	Acknowledging1	.86	-	-	.91
	Acknowledging2	.84	.04	.000	
	Acknowleding3	.87	.04	.000	
	Acknowleding4	.87	.04	.000	
Guiding Feedback	Guiding1	.79	-	-	.89
	Guiding2	.83	.04	.000	
	Guiding3	.81	.05	.000	
	Guiding4	.80	.05	.000	

*** $p < .001$

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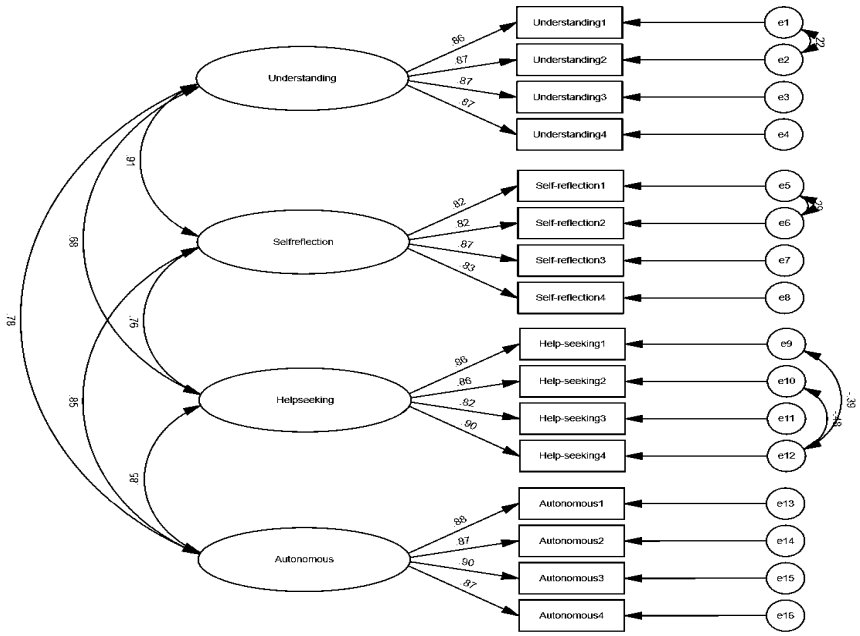
4.3.1.2. Confirmatory Factor Analysis of EFI ‘Feedback Outcome’

Findings of the CFA for ‘feedback outcome’ revealed that the 4-factor model showed a fit data. The model fit indices revealed a result of RMSEA index of .055, CFI, .981, and TLI. 976, suggesting a good model fit, as shown in <Table 32>

<Table 32> Model fit ‘Feedback outcome’

Model	X^2	df	RMSEA	CFI	TLI
4-factor	245.076	94	.055	.981	.976

*** p < .001



[Figure 3] Result of Confirmatory Factor Analysis of ‘feedback outcome’

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The standardized factor loadings were examined, and the results are shown in <Table 33>. The reliability coefficients of each sub-scale demonstrated well between .91~.93.

All items showed significant values of standardized factor loadings ranging from .82~.90.

<Table 33> Confirmatory factor analysis of EFI 'feedback outcome'

Construct	Item	Factor Loading	*S.E.*	*P*	Cronbach a
Understanding	Understanding1	.86	-	-	.93
	Understanding2	.87	.04	.000	
	Understanding3	.87	.04	.000	
	Understanding4	.87	.04	.000	
Self-reflection	Self-reflection1	.82	-	-	.91
	Self-reflection2	.82	.04	.000	
	Self-reflection3	.87	.04	.000	
	Self-reflection4	.83	.04	.000	
Help-seeking	Help-seeking1	.86	-	-	.91
	Help-seeking2	.86	.04	.000	
	Help-seeking3	.82	.04	.000	
	Help-seeking4	.90	.04	.000	
Autonomous Motivation	Autonomous1	.88	-	-	.93
	Autonomous2	.87	.04	.000	
	Autonomous3	.90	.03	.000	
	Autonomous4	.87	.04	.000	

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4.3.1.3. Correlations between the Latent Constructs of EFI

Correlation analysis was performed to examine the correlations between the latent constructs of the ‘characteristics of effective feedback’ (<Table 34>) and the ‘feedback outcome’ (<Table 35>). The constructs were positively correlated for the ‘characteristics of effective feedback’ (r=.787~.836) and positive correlation existed equally for the ‘feedback outcome’ (r=.640~.823). High correlations between the latent constructs of the ‘characteristics of effective feedback’ means that feedback practice not only contains of one specific characteristic of feedback, but it can occur in combination of other characteristics of feedback. For instance, *interactive feedback* was significantly correlated with acknowledging feedback (r=.836). This can be explained in that interactive feedback allows conversation between instructor and student, where the instructor-student relationship is naturally established. Trusting relationships between instructor and student were found as essential for students to accept the feedback (e.g., Kim, 2011). Thus, acknowledging words, encouragement, and sympathy are possibly related to interactive feedback.

The high correlation of the latent constructs of ‘feedback outcome’ can be interpreted as that the constructs refer to the self-regulated learning. The construct *understanding* is a part of the cognitive strategy, whereas *self-reflection* is classified as metacognitive strategy in this research. Surprisingly, the two constructs were highly correlated which confirms the literature that self-regulated learners activate knowledge by self-questioning (Schunk, 2005) and that self-regulated learners can control the cognitive, behavioral, and motivational strategies for learning (Zimmerman, 1990).

The correlations of the latent constructs of ‘characteristics of effective feedback’ and ‘feedback outcome’ (<Table 36>) were equally positively correlated (r=.647~.786) which implicates that feedback promotes self-regulated learning (Butler & Winne, 1995).

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<Table 34> Correlations of ‘Effective Feedback’ Instrument (EFI): Characteristics of Effective Feedback’ Scores

	Detailed Feedback	Guiding Feedback	Acknowledging Feedback	Interactive Feedback
Detailed Feedback				
Guiding Feedback	.814***			
Acknowledging Feedback	.797***	.818***		
Interactive Feedback	.766***	.835***	.836***	
Timely Feedback	.787***	.798***	.831***	.818***

***significant at p<.001

<Table 35> Correlations of ‘Effective Feedback Instrument (EFI): ‘Feedback Outcome’ Scores

	Understanding	Self-reflection	Help-seeking
Understanding			
Self-reflection	.823***		
Help-seeking	.640***	.703***	
Autonomous Motivation	.716***	.783***	.795***

***significant at p<.001

<Table 36> Correlations of ‘Effective Feedback’ Instrument (EFI): Characteristics of Effective Feedback’ Scores and ‘Feedback Outcome’ Scores

	Detailed Feedback	Guiding Feedback	Acknowledging Feedback	Interactive Feedback	Timely Feedback
Understanding	.786***	.764***	.760***	.760***	.760***
Self-reflection	.767***	.748***	.761***	.751***	.751***
Help-seeking	.647***	.654***	.728***	.716***	.682***
Autonomous Motivation	.717***	.710***	.784***	.752***	.744***

***significant at p<.001

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4.3.2. Convergent and Divergent Validation

Convergent and divergent validity was used to assess the validity by examining the correlations with 'Effective Feedback' Instrument and other constructs of scales that were revealed to be positively correlated with feedback in prior research. The convergent and divergent validity was examined with the Pearson's correlation coefficients for the theoretically correlated construct.

4.3.2.1. Correlations with Academic Self-Efficacy

There is an evidence revealing that feedback has an influence on self-efficacy (Chan & Lam, 2010). It was expected that the construct academic self-efficacy to be aligned with the 'characteristics of effective feedback' and 'feedback outcome'. The construct was drawn from the Academic Self-Efficacy Scale of Kim (2001).

Correlations were computed to determine the relations between EFI and the a*cademic self-efficacy*, and significant correlations were found between all constructs of the 'characteristics of effective feedback', showing a correlation between .411~.451 (<Table 36>). *Academic self-efficacy* was most highly correlated with *acknowledging feedback* (r=.451) which confirms the prior research that positive feedback, such as effort praise is critical in that it promotes the self-efficacy (Burnett, 2011; Schunk, 1986).

'Feedback outcome', demonstrated a correlation between .420~.524 (<Table 37>) with *academic self-efficacy*. The correlation between *autonomous motivation* and *academic self-efficacy* showed the highest score (r=.524). As it was found in previous studies (e.g., Lee et al., 2021; Zimmerman & Cleary, 2009) that self-efficacy helps to motivate students to learn and facilitate their self-regulated learning the high correlations between scores on EFI and those on Academic self-efficacy demonstrate the convergent validity.

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<Table 37> Correlations of Academic Self-Efficacy and Effective Feedback: 'Characteristics of Effective Feedback' Scores

	EFI Detailed Feedback	EFI Guiding Feedback	EFI Acknowledging Feedback	EFI Interactive Feedback	EFI Timely Feedback
Academic Self-Efficacy	.435***	.414***	.451***	.422***	.411***

***significant at p<.001

<Table 38> Correlations of Academic Self-Efficacy and Effective Feedback: 'Feedback Outcome' Scores

	EFI Understanding	EFI Self-reflection	EFI Help Seeking	EFI Autonomous Motivation
Academic Self-Efficacy	.420***	.463***	.482***	.524***

***significant at p<.001

4.3.2.2. Correlations with Learning Motivation

Feedback can have varying impact on student motivation, which, in turn, has an influence on the performance (Vollmeyer & Rheinberg, 2006). This research investigated the correlations between EFI and the goal orientation. The goal orientation and feedback has been found to be positively related in prior research (e.g., VandeWalle, Cron, & Slocum Jr., 2001), especially goal orientation considered to influence feedback seeking behavior (e.g., Whitaker & Levy, 2012). This research attempted to investigate whether the research results of prior studies could be confirmed. Correlation analysis was computed to determine the correlations between Goal-orientation and EFI. Significant correlations were found for 'characteristics of effective feedback' with *mastery orientation* (r=.470~.500). Interestingly, highest correlation was revealed between *mastery orientation* and *timely feedback* (r=.500). Possible explanation is that students with high mastery orientation are curious about feedback for their improvement, and therefore, may seek to receive feedback in a timely manner. A number of studies have shown

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that mastery goal orientation, along with timely feedback, can enhance the probability of achievement in learning and self-regulation (Moeller, Theiler, & Wu, 2021).

There were statistically significant correlations between *performance orientation* and *detailed feedback* (r=.120), as well as with *guiding feedback* (r=.170). However, this result revealed opposite findings of prior studies stating that performance oriented students view feedback as a judgment about oneself (Park & Sohn, 2020).

There was no significant correlation found for performance avoidance, as shown in <Table 39>.

<Table 39> Correlations of Goal-Orientation and Effective Feedback: 'Characteristics of Effective Feedback' Scores

	EFI Detailed Feedback	EFI Guiding Feedback	EFI Acknowledging Feedback	EFI Interactive Feedback	EFI Timely Feedback
Mastery Orientation	.489***	.491***	.470***	.455***	.500***
Performance Orientation	.120***	.170***	.112*	.106*	.149*
Performance Avoidance	-.007	-.017	-.037	-.029	-.004

***significant at p<.001; *significant at p<.05

Correlations were computed to determine the relations between the EFI and the Goal-orientation, and significant correlations were found for feedback outcome with *mastery orientation*, showing a significant correlations between .421~.544. *Self-reflection* (r=.544) and *autonomous motivation* (r=.544) showed the highest correlations to *mastery orientation*.

Performance orientation was significantly correlated to all variables of 'feedback outcome' (r=.128~.158) with highest correlation to *autonomous motivation* and also *self-reflection*. However, the scores were significantly lower than that of mastery oriented students. This result confirms statements of scholars suggesting that students adopting the mastery orientation engage in more self-regulated learning than those with *performance orientation* (Ames, 1992; Pintrich & Schunk, 1996).

There was no significant correlation found for performance avoidance, as shown in <Table 40>.

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<Table 40> Correlations of Goal-Orientation and Effective Feedback: 'Feedback outcome' Scores

	EFI Understanding	EFI Self-reflection	EFI Help Seeking	EFI Autonomous Motivation
Mastery Orientation	.492***	.544***	.421***	.544***
Performance Orientation	.128***	.157***	.146***	.158***
Performance Avoidance	-.021	.028	.022	.013

***significant at p<.001; *significant at p<.05

For both 'characteristics of effective feedback' and 'feedback outcome', no significant correlations were found. The results confirm that mastery orientation is positively related to the use of self-regulation strategies, academic achievement, and positive affect, while performance avoidance generally revealed the opposite for all variables (e.g., Kim & Park, 2014; Middleton & Midgley, 1997). Thus, the results established both the convergent and divergent validity.

4.3.2.3. Correlations with Instructor-Student Relationship

Prior research of feedback accounted that a trusting relationship between the teacher and student to be established for feedback to be accepted by the student (Carless & Boud, 2018; Kim, 2005). The 'Educational Relationship' Scale is drawn from the literature review of teacher-student relationship, interaction, and teaching (Kim, 2016). To investigate whether the components describing the teacher-student relationship could be confirmed with the 'Effective Feedback' Instrument, correlations were assessed between the two instruments. As a result, significant correlations were found for all variables of the 'characteristics of effective feedback' (r=.574~.754) as shown in <Table 41>. The highest correlation was found between *dialogic interaction* and *interactive Feedback* (r=.754) which strongly confirms the convergent validity. *Concern* and *interactive Feedback* were highly correlated (r=.735). This result confirms the study of Van der Schaaf et al. (2013) who identified three essential elements of feedback

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interaction stimulating student involvement. One of the criteria was that feedback is tailored to the students' needs where instructors have to pay attention and continuously modify their feedback based on students responses (Adie et al., 2018). Furthermore, prior studies (e.g., Nicol & Macfarlane-Dick, 2006; Charteris & Smardon, 2013) emphasized that interactive feedback should engage active listening which would be related to concern.

<Table 41> Correlations of 'Instructor-Student Relationship' and EFI: 'Characteristics of Effective Feedback' Scores

	ETF Detailed Feedback	ETF Guiding Feedback	ETF Acknowledging Feedback	ETF Interactive Feedback	ETF Timely Feedback
Respect	.648***	.657***	.706***	.674***	.679***
Concern	.676***	.669***	.731***	.735***	.727***
Dialogic Interaction	.688***	.726***	.739***	.754***	.707***
Trust	.644***	.646***	.634***	.625***	.647***
Expectation	.672***	.678***	.714***	.690***	.682***
Enthusiasm	.595***	.589***	.595***	.574***	.634***
Growth	.651***	.631***	.692***	.662***	.681***

***significant at p<.001

Correlations were assessed to determine the relations between and the educational relationship and the 'feedback outcome', and significant correlations were found for all variables (r=.473~.734) as shown in <Table 42>. The highest correlation was shown between *dialogic interaction* and *self-reflection* (r=.734), whereas, surprisingly the lowest correlation was shown between *enthusiasm* and *help-seeking* (r=.473). In the study of Adie et al. (2018), instructors who asked questions to students encouraged students' reflection on their learning, which leads to the establishment of the convergent validity.

The correlations between *expectation* and *autonomous motivation* confirm the previous research (Kim, 2006; Lee & Schallert, 2008), stating that instructor's expectations towards students lead to student motivation in learning, as students feel acknowledged when the instructor acknowledge the potential in students.

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Thus, the significant positive correlations between EFI and instructor-student relationship support the convergent validity.

<Table 42> Correlations of 'Educational Relationship Scale' and 'Effective Feedback' Instrument (EFI): Feedback Outcome' Scores

	EFI Understanding	EFI Self-reflection	EFI Help Seeking	EFI Autonomous Motivation
Respect	.665***	.672***	.643***	.707***
Concern	.664***	.731***	.695***	.725***
Dialogic Interaction	.717***	.734***	.657***	.713***
Trust	.695***	.661***	.502***	.599***
Expectation	.612***	.658***	.635***	.682***
Enthusiasm	.628***	.608***	.473***	.532***
Growth	.667***	.694***	.622***	.730***

***significant at p<.001

4.3.2.4. Differences across Academic Disciplines

In the literature, feedback was found to have different impact depending on the academic disciplines (e.g., Carless et al., 2020). This research aimed to examine if there was a difference between academic disciplines as revealed in the prior research. Finding consistent result confirming previous studies serve to the establishment of convergent validity.

For the 'characteristics of effective feedback' (<Table 43>), the result of one-way analysis of variance (ANOVA) revealed statistically significant differences between the academic disciplines which were humanities/social sciences, natural science/engineering, and arts/physical education, There were differences for *detailed feedback* (F=25.831, p<.001), *guiding feedback* (F=10.813, p<.001), *acknowledging feedback* (F=22.624, p<.001), *interactive feedback* (F=11.474, p<.001), and *timely feedback* (F=16.915, p<.001). In general, the academic discipline of natural science/engineering showed the

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lowest mean scores (M= 3.13~3.22) for all variables in comparison to humanities/social sciences (M= 3.45–3.54), and arts/physical education (M= 3.47~3.55). The lowest score was found on *acknowledging feedback,* suggesting that the students from natural science/engineering received low amount of feedback that involved acknowledging and encouraging words.

For ‘feedback outcome’, the result of one-way analysis of variance (ANOVA) equally demonstrated statistically significant differences between the academic disciplines for *understanding* (F=14.982, p<.001), *self-reflection* (F=17.033, p<.001), *help-seeking* (F=15.505, p<.001), and *autonomous motivation* (F=22.497, p<.001). Natural science/engineering showed the lowest mean scores (M=2.88~3.28) in comparison to humanities/social sciences (M= 3.19~3.56) and arts/physical education (M= 3.33~3.58). The lowest score was shown on the variable of *help-seeking*, which suggests that students of natural science and engineering were less motivated to seek for feedback or help for their learning.

<Table 43> Differences across academic disciplines of ‘characteristics of effective feedback’ and ‘feedback outcome’

(N=524)

	Humanities/ social science (n=225)	Natural science/ engineering (n=192)	Arts/ physical education (n=107)	*F*	*Scheffe*	Total M (SD)
Detailed Feedback	3.54[b] (.54)	3.13[a] (.77)	3.55[b] (.66)	25.831***	a < b	3.39 (.66)
Guiding Feedback	3.46[b] (.53)	3.22[a] (.73)	3.49[b] (.52)	10.813***	a < b	3.38 (.62)
Acknowledging Feedback	3.48[b] (.58)	3.08[a] (.77)	3.47[b] (.56)	22.624***	a < b	3.33 (.68)
Interactive Feedback	3.44[b] (.55)	3.18[a] (.75)	3.47[b] (.53)	11.474***	a < b	3.46 (.53)
Timely Feedback	3.45[b] (.53)	3.19[a] (.73)	3.54[b] (.52)	16.915***	a < b	3.39 (.63)
Understanding	3.56[b] (.47)	3.28[a] (.73)	3.58[b] (.47)	14.982***	a < b	3.46 (.59)
Self-reflection	3.50[b] (.51)	3.18[a] (.74)	3.50[b] (.53)	17.033***	a < b	3.38 (.63)
Help-seeking	3.19[b] (.69)	2.88[a] (.85)	3.33[b] (.61)	15.505***	a < b	3.11 (.76)
Autonomous Motivation	3.37[b] (.62)	2.97[a] (.81)	3.42[b] (.55)	22.497***	a < b	3.24 (.71)

***significant at p<.001

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4.3.3. Concurrent Validation

The concurrent validity measures how well a new instrument compares to the scores of other instruments (Dunlow et al., 2007). The concurrent validity was performed through conducting the correlation analysis with 1) the 'Formative Feedback Practice Scale (FFPS)' and the 'characteristics of effective feedback', and 2) the 'Feedback Literacy Scale (FLS) and 'feedback outcome'.

As the <Table 44> shows, the result shows statistically significant values between .734~.834 (p<.001), confirming the concurrent validity. *Encouragement* showed the highest correlation with *acknowledging feedback* (r=.859) which confirms that the variable encouraging messages were inherent in both the construct of *encouragement* and *acknowledging feedback*. In fact, *encouragement* involved the item "My instructor provides positive feedback involving praise and encouragement." which shows a high similarity of the item "My instructor acknowledges students' thoughts and provided feedback with a thoughtful tone." of EFI.

Planning and *detailed feedback* were highly correlated (r=.834) which could be explained by one item of planning includes "The teacher prepares detailed informations for students to correct their activities" showing similarity to the items of detailed feedback, thus, validating the concurrent validity.

<Table 44> Correlations between 'Formative Feedback Practice Scale (FFPS)' and 'Effective Feedback' Instrument (EFI): Characteristics of Effective Feedback' Scores

	EFI Detailed Feedback	EFI Guiding Feedback	EFI Acknowledging Feedback	EFI Interactive Feedback	EFI Timely Feedback
FFPS Planning	.834***	.760***	.788***	.769***	.784***
FFPS Process	.762***	.734***	.751***	.792***	.768***
FFPS Encouragement	.785***	.769***	.859***	.812***	.791***

***significant at p<.001

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The concurrent validity was performed comparing the 'Feedback Literacy Scale (FLS)' and the 'feedback outcome' of EFI. As the <Table 45> shows, the concurrent validity shows statistically significant values between .549~.753 (p<.001). The highest correlation was drawn by *understanding* of the 'Feedback Literacy Scale' and *self-reflection* of EFI (r=.761). Both variables of *understanding* were highly correlated (r=.753) which could be possibly explained that similar constructs were measured. In fact, the construct *understanding* of the Feedback Literacy Scale involved the item "Through feedback, I can identify areas that I either didn't know or did wrong.", which reflects the construct of *self-reflection* in EFI. One of the item representing self-reflection was "Feedback helped me to understand what I already knew and didn't know."

Taken together, the concurrent validity of EFI and the Formative Feedback Practice Scale, as well as the Feedback Literacy Scale was demonstrated by the high correlations, predicting that EFI and the already established measurement tools measured the same constructs which is the criteria for achieving the concurrent validity.

<Table 45> Correlations between 'Feedback Literacy Scale(FLSS)' and 'Effective Feedback' Instrument (EFI): Feedback Outcome' Scores

	EFI Understanding	EFI Self-reflection	EFI Help Seeking	EFI Autonomous Motivation
FLSS Feed-up	.706***	.654***	.539***	.654***
FLSS Understanding	.753***	.761***	.581***	.688***
FLSS Feedback Seeking	.549***	.556***	.584***	.581***
FLSS Affect	.635***	.680***	.584***	.711***

***significant at p<.001

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5. Discussion

This chapter presents a discussion of the results. First, a summary of the research process is provided. Second, the implications of the current study are explored, followed by a discussion of its limitations. Finally, suggestions for future research are listed.

5.1. Summary of Main Findings

This study aimed to develop an 'Effective Feedback' instrument (EFI) to measure the 'characteristics of effective feedback' and the 'feedback outcome' based on the perspectives of students pursuing higher education.

Prior research has attempted to measure specific constructs related to effective feedback (e.g., the utility of feedback, feedback quality, and behavioral changes). However, a major limitation of the existing feedback instruments (e.g., Jellicoe & Forsythe, 2019; Kim & Sohn, 2021; King, Schrodt, & Weisel, 2009; Park & Sohn, 2019) is that the constructs have not been explored comprehensively to cover all aspects of effective feedback and its outcomes. Furthermore, previous studies on feedback instruments have not integrated all aspects of the characteristics of effective feedback that have been reported in the literature.

Although feedback is an essential concept in instruction (King et al., 2009) that plays a pivotal role in improving teaching quality, prior studies have not provided a feedback instrument for application in higher education classrooms. As the function of student-centered learning is increasing in higher education (McCabe & O'Connor, 2014), instructors need to develop their teaching skills consistently to facilitate effective learning. Therefore, a comprehensive and robust instrument that measures the 'characteristics of effective feedback' and the 'feedback outcome' could offer instructors some insights into their feedback practice and provide opportunities to modify their teaching strategies. As prior studies often indicated, differences in perceptions of effective feedback between teachers and students (e.g., Carless, 2006), an instrument

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involving both aspects of ‘characteristics of effective feedback’ and the ‘feedback outcome,’ may provide an opportunity to close the gap between the differing perceptions.

To overcome the limitations found in previous literature, this study attempted to develop an ‘Effective Feedback’ Instrument (EFI) for instructors to track their practices in the classroom, which in turn provides guidance regarding improvement in teaching.

The development of the constructs for the EFI was based on a deductive and inductive approach. The initial phase of the research sought to conceptualize the constructs of the ‘characteristics of effective feedback’ and ‘feedback outcome’ based on the review of the literature and an open-ended survey to integrate students’ perspectives.

The open-ended survey was conducted with 230 undergraduate students to investigate the ‘characteristics of effective feedback’ and ‘feedback outcomes.’ Through a thorough review of the literature, followed by the interpretation and synthesis of the data, two frameworks covering the ‘characteristics of effective feedback’ and ‘feedback outcomes’ have been established. Five constructs (*detailed feedback*, *guiding feedback*, *acknowledging feedback*, *interactive feedback*, and *timely feedback*) for the ‘characteristics of effective feedback,’ and seven constructs (*understanding*, *learning method*, *self-reflection*, *effort*, *help-seeking*, *intrinsic motivation*, and *self-efficacy/confidence*) for “feedback outcome” were identified. Some of the themes that emerged from the qualitative responses (i.e., detailed feedback, facilitative feedback, and acknowledging feedback) existed in prior research on effective feedback (e.g., Dawson et al., 2018; Golke et al., 2015). However, there were distinctive emphases in describing feedback from students’ points of view. For instance, in prior research, the term *facilitative feedback* was defined as providing hints, suggesting directions for improvement, and questioning (e.g., Straub, 1996). In this study, students used the words “sharp questions” and “reverse questions” added a clear guiding essence to the term *facilitative feedback*.

Based on the established constructs, 92 initial items were reviewed by expert panels for content validity. The experts were specialized in educational psychology and psychometry, educational technology, teaching and learning, and feedback research. The assessment of content validity examined two aspects: 1) validating the framework and

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its categories, and 2) validating the items, and providing further suggestions on these items. Using 5-point evaluation scales, the expert panel rated how well the items represented the constructs of the frameworks. Content validity was determined using the average, content validity ratio (CVR) and content validity index (CVI). Items with an average score lower than 3.50, 0.99 for CVR, and 0.83 for CVI, were either eliminated or modified. Modification was conducted if the specific content of the items was essential for representing the constructs. After experts conducted two stages of content validity, an initial item pool of 68 items was retained for the pilot test.

A pilot test was conducted on 278 undergraduate students. Prior to conducting the Exploratory Factor Analysis (EFA), the Kaiser-Meyer-Olkin measure of sampling adequacy was tested to examine whether the scale met the requirement for factor analysis (Field, 2000). The KMO showed a value of .944 for 'characteristics of effective feedback' and .955 for "feedback outcome," indicating that factor analysis could yield reliable factors (Field, 2000).

5-factor structures for the 'characteristics of effective feedback' and 4-factor structures for 'feedback outcomes' were established through exploratory factor analysis (EFA). As reliability is essential in psychological measurements (Ghiselli et al., 1981), the research examined reliability through testing internal consistency, and the results showed Cronbach's α of .89~.94 for 'characteristics of effective feedback' and .91 ~ .93 for 'feedback outcome.' Considering reliability and factor loadings, four items with the highest loadings were selected from each construct that best represented each factor. According to the results of the EFA and the internal reliability test, the initial items were reduced to 36 for the main test.

The main test was conducted with 524 undergraduate students from three universities. The results of the Confirmatory Factor Analysis (CFA) confirmed the 5-factor structure of the 'characteristics of effective feedback,' and the 4-factor structure of the 'feedback outcome' that built the 'Effective Feedback' Instrument (EFI). The suggested structures showed an acceptable model fit, providing evidence of the construct validity of the measurement tool. The relationship between the latent variables showed a significantly high correlation.

Prior research has demonstrated positive associations between feedback and academic

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self-efficacy (Burnett, 2011), goal orientation (e.g., Watling et al., 2013), instructor-student relationships (e.g., Kim, 2016), and academic disciplines (e.g., Carless et al., 2020). This study aimed to investigate whether equivalent findings were found, as in prior research, which was an important process in validating the instrument through convergent and divergent evidence. Convergent validity was established for all correlations between the EFI and academic self-efficacy, mastery/performance orientation, and instructor-student relationship. Divergent validity was confirmed for correlations between EFI and performance avoidance, as the constructs were not significantly related. Furthermore, there were differences in students' perceptions of feedback in academic disciplines, as revealed in prior research (e.g., Carless et al., 2020).

Lastly, concurrent validity was established between EFI and the Formative Feedback Practice Scale (FFPS) and Feedback Literacy Scale (FLS). The constructs were significantly correlated, revealing that EFI measured the same constructs that were assessed in existing validated instruments.

5.2. Implication for this Study

This study highlights important implications for teaching. First, it developed and validated an instrument to demonstrate feedback functions in higher education by integrating the aspects of the 'characteristics of effective feedback' and the 'feedback outcome.' Despite the importance of feedback in education, existing feedback instruments have limited ability to cover and identify essential feedback characteristics and outcomes. By incorporating these two aspects (characteristics of effective feedback and feedback outcome), EFI may act as a guideline tool for instructors to reflect on their feedback practice and understand in-depth how feedback has an impact on student learning.

Second, the EFI is an instrument that is not based solely on previous literature. This research is significant in that the 'characteristics of effective feedback' and 'feedback

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outcomes' were comprehensively identified and represented through both literature review and students' perceptions of the open-ended survey. Thus, this research represented how the characteristics of effective feedback and its outcomes mentioned in prior research were confirmed and reconstructed in students' statements. For instance, *detailed feedback* is comparable to *elaborated feedback*, and student responses described detailed feedback as explicit/specific explanations of what was done well and what should be improved, providing examples when needed and suggestions for improvement, as well as clear answers to students' questions. These responses were partly confirmed by prior studies (e.g., Dawson, 2018; Dowden, 2013; Henderson et al., 2021) that state that detailed feedback leads students to perceive it as useful. Contradictory statements are also prevalent regarding detailed feedback. In the study by Grove and Good (2020), some students found overly detailed feedback boring. In particular, good students do not always require detailed feedback (Voelkel et al., 2020). However, in the open-ended survey, 167 students mentioned detailed feedback as effective, indicating the importance of detailed guidance in their learning. It is possible that students who do not appreciate detailed feedback may prefer the facilitative essence of feedback.

Guiding feedback plays a facilitative role and involves questions from instructors to initiate their own thoughts and answers. The students in this study perceived the provision of reverse or sharp questions as effective because it enhanced their critical thinking. Facilitative feedback is valued by students when they perceive autonomy support from teachers (e.g., Ransdell, 1999; Straub, 1996, 1997; Treglia, 2009; Underwood & Tregidgo, 2006). Goh and Walker (2018) found that students express different emotional responses to teacher feedback. Facilitative feedback was associated with negative feelings in students (aged 12-13) because teachers' questions possibly acted as criticism rather than guidance to improve. Thus, these students may not have felt autonomous support from their teachers. With regard to the findings of this research, students who participated in the open-ended survey were predominantly mature in age, and the probability that they could understand how facilitative feedback could promote their self-reflection was higher. However, instructors may have provided autonomous support to students while providing feedback. As Straub (1996) stated, there is a need for instructors to balance the amount of facilitative feedback and detailed

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feedback that is, both types of feedback could be supplementary.

Acknowledging feedback represents *positive feedba*ck and emphasizes emotional and relational support from the instructor, showing respect towards the students' opinions, confirming their answers, and expressing sympathy towards them. Previous studies have stated that relationships based on trust between teachers and students are essential for students to accept feedback (Carless & Boud, 2018; Kim, 2005; Lee & Schallert, 2008). This study found that students tended to actively invest effort when they received feedback and perceived trust in instructors. Thus, instructors should frequently acknowledge students' efforts and confirm their reactions to promote their motivation and encourage the use of feedback.

The students appreciated the ongoing interaction with the instructor. *Interactive feedback* was essential to better understand the feedback they received. Thus, interactive feedback is more than simply promoting students' thought processes. Prior studies emphasize interactive exchange, wherein interpretations of learning materials are shared, negotiated, and clarified (e.g., Steen-Utheim & Wittek, 2017). Interactive feedback provides opportunities for students to ask questions and instructors to clarify their comments (Xu & Carless, 2017). Moreover, interactive feedback enables a deeper understanding of the learning material through the active engagement of students and instructors in the interaction. Instructors may encourage instructor-student interactions by leading an ongoing discussion in class by incorporating students' perspectives on active participation rather than instructor-centered teaching.

Timely feedback was found to be essential according to students' perceptions in prior studies (e.g., Blair & McGinty, 2013; Mulliner & Tucker, 2017). However, 13 student responses revealed that timely feedback was effective. One assumption was that students perceived other feedback characteristics to be more effective than timing. However, it is recommended that specific characteristics of feedback be provided in a timely manner so that they are still valid for students to remember and use them for future assignments.

Four final constructs of 'feedback outcomes' were derived that were: *understanding*, *self-reflection*, *help seeking*, and *autonomous motivation*. These constructs addressed some of the variables of self-regulated learning. Prior studies have shown that feedback

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was among the most important factors facilitating self-regulated learning (Nicol & Macfarlane-Dick, 2006; Zimmerman & Campillo, 2003). For instance, students revealed that feedback helped their understanding of the learning content and the subject, which directs the discussion to cognitive strategy, that involves remembering and understanding the material to be studied (Pintrich & Van de Groot, 1990). Furthermore, identifying the goal of learning, applying feedback to subsequent tasks, and avoiding mistakes through feedback were some of the aspects mentioned in the responses of the open-ended survey. In fact, qualitative studies of student perception often revealed dissatisfaction in students about instructor feedback because it was not clearly provided, which hindered a deep understanding of the learning material (e.g., Blair et al., 2013). This was the case in earlier studies that investigated written feedback, where comments were delivered unilaterally (Chanock, 2000; Weaver, 2006), which prevented students from asking for feedback. There is a need for instructors to understand students' perspectives to provide feedback suited to their level. Promoting interactions with students could possibly lead to a better understanding in instructors regarding areas and opportunities for diverse feedback that promote student understanding.

The role of *self-reflection* in education has harbored an increased interest in educators (Lew & Schmidt, 2011). Self-reflection is a part of the metacognitive strategy (Hattie & Timperley, 2007), where effort is invested in evaluating the degree of one's understanding and effort. Students valued feedback because it made them revise their assignments and pay more attention to areas that needed improvement. Prior research suggests that guiding feedback promotes self-reflection in students (e.g., Kramarski & Zeichner, 2001), implying that instructors can provide opportunities for students to revise their assignments and tasks.

It appeared as though students' courage to actively ask for help was enhanced through feedback from the instructor. *Help-seeking* behavior was found to be related to engagement and motivation (Ryan & Pintrich, 1997), which was confirmed through the responses of the open-ended survey. Students opined that feedback led them to ask more questions, which in turn, enhanced their learning experience. Thus, this research suggests that instructors should actively provide interactive feedback to communicate with students with the goal of promoting a supportive environment where they have the

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courage to ask for help.

Zimmerman (1990) stated that an important aspect of self-regulated learning is that motivation and learning cannot be fully understood devoid of each other. It was found that feedback enhanced students' autonomous motivation, which involved willingness to work harder and increased confidence in one's ability and performance. According to literature, positive feedback enhances intrinsic motivation (Deci, 1972b), thereby confirming the results of this study. Acknowledging feedback in this research not only included praise, but also extending respect and trust towards the students, which possibly led students to invest more effort into learning with the aim of meeting the expectations of the instructor (Kim, 2006; Lee & Schallert, 2008). Thus, instructors need to be aware of how their feedback could have an impact on student motivation, especially in matters such as self-efficacy, because feedback conforming to students' motivational aspects may have to be provided for students to accept the feedback fully.

This study found high correlations between the latent constructs of EFI. An explanation for the significant correlations between the constructs of 'characteristics of effective feedback' is the array of the characteristics of effective feedback that was stated, especially by students, for feedback to be effective. The identifiable characteristics of effective feedback are detailed and specific (Deeley et al., 2019), encouraging and motivational (Nicol & MacFarlane-Dick, 2006), prompt and timely (Blair & Ginty, 2013), with information that could be used in the future (Winstone et al., 2017). Responses to the open-ended questions of this research did not state that only one feedback characteristic was effective. Students' understanding of effective feedback is formed from the diverse characteristics of feedback.

High correlations of the latent constructs of 'characteristics of effective feedback' and 'feedback outcome' confirm most of the prior studies that investigated feedback and learning achievement or outcome (e.g., Harks, 2014; Kim et al., 2018; Lee & Park, 2019), thereby approving the validity of the instrument. In the open-ended survey, students tended to describe the effective feedback of instructors by simultaneously bridging them with reason. For instance, students stated that *detailed feedback* helped them understand the learning content, or that *acknowledging feedback* led to an increase in self-efficacy.

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Significant correlations between academic self-efficacy and EFI were revealed in the results. In fact, the correlations between academic self-efficacy and acknowledging feedback and between academic self-efficacy and autonomous motivation were found to be high. In particular, prior research has indicated that acknowledgment or praise of student effort is essential in promoting self-efficacy (Schunk, 1986; Burnett, 2011; Mueller & Dweck, 1998). Thus, the results of this study confirm prior research, as some responses of the open-ended survey revealed that acknowledging comments on effort enhanced students' motivations and will to put more effort into the tasks. For instructors, awareness of the importance of providing feedback on student effort is essential for promoting the use and acceptance of feedback.

High correlations were found between the two aspects (mastery and performance approach) of goal orientation and EFI. An increasing number of studies have emphasized the uptake of feedback and stated that goal orientation was an antecedent for feedback seeking behavior (Leeknecht, Hompus, & Schaaf, 2019; Vande Walle, 2003). It was proposed that individuals with a mastery approach tend to seek feedback because they believe that their abilities are not fixed, while individuals with a performance approach tend to perceive feedback as criticism (VandeWalle, 2003). These results partly confirm the results of previous research. The mastery approach was highly correlated with help-seeking, which includes taking the initiative to seek help after receiving feedback. However, mastery approach was most correlated with self-reflection and autonomous motivation and confirms the prior studies revealing that this approach is positively correlated with interest in receiving feedback (Tuckey, Brewer, & Williamson, 2002) and the resultant intrinsic motivation (Bieg, Reindl, & Dresel, 2016). The mastery approach was exhibited high correlations with *guiding feedback*, which verified their preference for self-reflection. The high correlation between the mastery approach and *timely feedback* suggests that students with a mastery goal orientation may seek and wait for feedback frequently because they are interested in receiving feedback on their tasks. Thus, students seeking feedback may wish to receive feedback in a timely manner.

The decent correlation between the performance approach and *detailed feedback* and *guiding feedback* show findings contradictory to prior research (e.g., VanderWalle,

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2003), indicating that students with performance goal orientation tend to reject feedback due to fear relating to their self-esteem. However, the result of this study showed varied results, but it is clear that the correlation values are not as high as the correlations between the mastery approach and the 'characteristics of feedback' which in turn may confirm prior research that state that performance goal orientation is negatively associated with the use of feedback (Winstone et al. 2021).

The results revealed high correlations between the instructor-student relationship and EFI. The results confirm the findings of prior studies (e.g., Kim et al., 2021), which state that variables such as respect, concern, dialogic interaction, trust expectation and enthusiasm, and growth are embedded in the 'characteristics of effective feedback.' For instance, the high correlation between concern and interactive feedback reiterates the findings of prior research (e.g., Adie et al., 2018) that instructors are interested in facilitating students' participatory role in the use of feedback through dialogue. Furthermore, respect and timely feedback were highly correlated, which may indicate that instructors tend to provide timely feedback because they respect their students. Thus, the correlations between the instructor-student relationship and EFI imply that instructors' attitudes may have a high impact on their feedback-giving practices.

The strong correlation between instructor-student relationship and EFI shows that a positive instructor-student relationship is essential for an effective feedback practice. The significance of the relationship between students and instructors for successful student learning has been recognized in research on primary and secondary education (Bernstein-Yamashiro, & Noam, 2013). According to prior studies (Carless & Boud, 2018; Kim, 2005; Lee & Schallert, 2008), trust in the instructor is essential for feedback to be accepted by students. The effectiveness of feedback depends on how the instructor accepts and communicates with the students, and the trust of the students towards the instructor influences students' acceptance and use of feedback. Instructors need to focus on the interactive aspects of feedback to gain an understanding of their students' needs and learning processes.

Students' perceptions of effective feedback differ across academic disciplines (Carless, 2020). Students' perceptions of nature/science disciplines, in particular, displayed low values for 'characteristics of effective feedback' and 'feedback outcome.' This finding

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suggests that there is a possibility that feedback may be provided in a summative form rather than a formative form with regard to delivering feedback messages about how to improve a task. Furthermore, the nature/science approach is more precise, accurate, and deterministic than the social science approach. Thus, it is possible that students received corrective feedback, that states whether the answer is correct or wrong. There may be fewer opportunities for instructors to provide guiding feedback or acknowledging feedback. However, prior studies have invested effort in building an interactive environment for nature/science subjects (e.g., Chin, 2007). Therefore, there is a need for consistent effort from instructors of nature/science disciplines that goes beyond corrective feedback to provide feedback that supports student improvement. Thus, certain characteristics of feedback may be more effective than others, depending on the learning context and situation. This research suggests a need for an instructor education program for effective feedback practice and the enhancement of feedback quality in higher education.

It is important to acknowledge that the constructs were established from the perspective of students. The 'Effective Feedback' Instrument (EFI) contributes to educational research, that is, it provides potential opportunities to close the gap between the instructor and students' perceptions about effective feedback.

Furthermore, this study implies that feedback is essential to facilitate aspects of self-reflection, motivation, and self-efficacy, which are essential elements for successful learning and growth in undergraduate students.

5.3. Limitation and Future Directions

A noteworthy limitation of this study is that instructors who granted permission to conduct the survey for this research tended to be passionate and interested in their classes and feedback processes. Therefore, the sample proportion may not have incorporated all feedback practices in higher education.

Furthermore, the limitation of this study is that it did not separate the feedback

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channels (written, oral, video, etc.). This study integrated assignment and oral feedback into the measurement tool. Developing a measurement tool by integrating diverse feedback channels may provide additional in-depth insights into the feedback process and more varieties of effective feedback for each task context.

EFI was originally developed in the Korean language, and the items were generated according to Korean culture and mindset. Therefore, it is not applicable to other languages. Thus, a validation of the translated items is suggested to examine the feedback practices in different cultures.

The characteristics of effective feedback and its outcome depending on various contexts, such as class activity, goal of the class, and characteristics of the teacher are to be explored by future studies. Considering that feedback is affected by the classroom climate, as well as the climate of the academic departments, investigating effective feedback by classifying the levels of department/school, class, and characteristics of students may lead to the implication that for feedback to be effective, there is a need for effort and support from the educational institution (i.e., university).

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Appendices

Appendix A. Consent form for students

대학수업을 위한 '효과적인 피드백' 측정도구 개발 및 타당화

안녕하십니까?
본 연구에서는 학생들의 학업과 성장에 도움을 주는 효과적인 교수자의 피드백을 특성을 파악하여 '효과적인 피드백' 측정도구를 개발하고자 합니다. 여러분의 답변은 대학교육의 개선을 위한 소중한 자료로 활용될 것입니다.

수집된 자료는 익명으로 분석에 사용되며, 연구 이외의 목적으로 사용하지 않을 것입니다. 본 설문에 대한 응답과 관련하여 옳고 그름이 없으며, 여러분이 느끼는 생각을 정확하게 표현해주시는 것이 가장 좋은 자료가 될 수 있으니 모든 문항에 솔직하게 답변해 주시기 바랍니다.

응답 시간은 약 15분에서 20분정도 소요될 예정이며, 조사 결과는 연구목적으로만 활용할 것을 약속드립니다.

설문지를 끝까지 응답해 주시고 성실히 답변해 주신 분들에게 모바일 상품권 5,000원권을 보내드리도록 하겠습니다. 설문을 완료하신 후 휴대폰 번호를 남겨주세요.

본 설문조사에 소중한 시간을 내주신 것에 대해 진심으로 감사드립니다.

조선대학교 일반대학원
교육심리전공
김규은

※ 본 조사와 관련하여 문의 사항이 있으시면 아래의 연락처로 연락 주십시오.

김규은
-*-****
E-mail: gyueunkim84@gmail.com

조선대학교
CHOSUN UNIVERSITY

연구참여자용(학생) 설명문 및 동의서

■ 연구 과제명 : 대학수업을 위한 ‘효과적인 피드백’ 측정도구 개발 및 타당화
■ 연구 책임자 성명 및 직위

구분	성명	소속	직위
연구책임자	김규은	조선대학교 일반대학원	박사 수료

본 연구에서는 학생들의 학업과 성장에 도움을 주는 효과적인 교수자의 피드백을 특성을 파악하여 ‘효과적인 피드백’ 측정도구를 개발하고자 합니다. 귀하는 연구자가 수행하는 연구의 대상자로 적절하다고 판단되어 이 연구의 참여를 요청받게 되었습니다. 귀하가 이 연구에 참여할 것인지를 결정하기에 앞서 아래 설명문의 내용을 신중하게 읽어봐 주십시오. 그리고 궁금하신 사항은 언제든지 질문하셔도 됩니다. 이 연구는 귀하의 자발적인 참여로 수행될 것이므로, 이 연구와 관련된 모든 내용을 이해하는 것이 중요합니다.
귀하께서 궁금해 하시는 모든 질문을 해주시고 충분히 답변을 받았다고 생각되신 후 참여 의사를 밝혀 주시고 응답해 주시기 바랍니다.

1. 연구의 목적

본 연구는 대학생들이 생각하는 효과적인 교수자의 피드백을 파악할 수 있는 피드백 측정도구를 개발하는 연구입니다.

2. 연구 참여기간과 대략의 연구대상자 수

본 연구에서는 학생들의 학업과 성장에 도움을 주는 효과적인 교수자의 피드백의 특성과 그 성과를 파악하여 ‘효과적인 피드백’ 측정도구를 개발하고자 합니다. 이 연구에 예상되는 참여 기간은 생명윤리위원회 승인일로부터 2022년 6월까지 약 8개월로, 2021년 2학기에 이루어지는 수업에서 여러분은 설문지를 작성하게 될 것입니다. 본 연구에 참여하는 연구대상자의 수는 약 총 830명 내외이며, 연구결과는 대학수업에서 학생들에게 피드백을 효과적으로 제공하는 데 유익한 지침으로 활용될 것입니다.

3. 연구대상자가 받게 될 각종 검사나 절차

이 연구에서는 설문지를 사용하게 되며 1회 약 15분에서 20분 실시됩니다.

4. 실험군 또는 대조군에 무작위 배정 여부 및 확률

이 연구에서는 피드백 제공의 다양성을 알아보기 위해 전공계열별 학생들을 대상으로 합니다.

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5. 연구대상자가 준수해야 할 사항

귀하가 이 연구에 참여하는 데에 동의하게 되시면, 1회 설문지를 작성하게 됩니다. 소요 시간은 약 15분에서 20분입니다.

6. 기대되는 이익 및 연구 참여로 인해 받게 될 금전적 보상

귀하가 이 연구에 참여하는 데에 있어서 직접적인 이득은 없습니다. 그러나 귀하가 제공하는 피드백에 관한 학습자의 경험을 이해하고 피드백을 제공하는 데에 있어서 그 효과성을 증진하는 데 도움이 될 것입니다. 또한 연구에 참여해 주신 분들에게 '모바일 상품권 5,000원권'을 설문을 끝까지 응답하신 후 보내드리도록 하겠습니다.

7. 연구대상자에게 미칠 것으로 예견되는 위험이나 불편

연구 참여 과정에서 귀하에게 미치는 부작용으로 설문 도중에 약간의 피로감을 느끼실 수 있습니다. 여러분이 연구참여가 힘들다고 느껴지는 경우에는 자유롭게 연구참여를 중단하실 수 있습니다. 본 연구의 참여여부를 해당 강좌의 교수자는 전혀 인지하지 못하며 본 수업의 참여나 성적에 아무런 영향을 미치지 않습니다.

8. 연구 참여와 관련된 손상 발생 시 연구대상자에게 주어질 보상

귀하는 언제든지 어떠한 불이익 없이 연구 기간 도중에 그만둘 수 있습니다.

9. 연구에 참여로 인해 연구대상자가 부담해야 할 예상 비용

이 연구의 참여에 따른 별도의 비용은 발생하지 않습니다.

10. 연구대상자가 선택할 수 있는 다른 중재

해당 없음

11. 연구 참여 결정은 자발적인 것이며, 연구도중 언제라도 중도에 참여를 포기할 수 있음

귀하가 본 동의서에 서명하는 것은, 이러한 사항에 대하여 사전에 알고 있었으며 이를 허용한다는 의사로 간주될 것입니다. 귀하는 연구자로부터 충분한 설명을 받고 자발적인 결정에 따라 연구에 참여하게 됩니다. 귀하가 이 연구에 참여하는 데 동의하지 않더라도 아무런 불이익을 받지 않으며 참여해야 할 의무는 없습니다. 또한 연구 참가에 동의한 후에라도 자유의사에 의하여 언제든지 이유를 제시하지 않고 동의를 취소할 수 있습니다.

12. 개인정보가 보장되지만, 연구자를 포함하여 관련자에게 자료가 보여 질 수 있음

설문조사에서 수집되는 개인정보의 경우, 설문지를 수합하는 용도로만 활용될 뿐입니다. 여러분의 응답내용이 개인정보와 더불어 공개되는 일은 없을 것입니다. 연구의 자료 분석 결과는 연구의 목적을 위해서만 졸업논문, 학회지나 학회에 공개될 것입니다. 이 과정에서

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귀하의 개인정보는 전혀 사용되지 않을 것입니다.

귀하의 신원을 파악할 수 있는 기록은 기밀유지가 되고 공개적으로 열람되지는 않습니다. 다만, 관련법이나 규정에 의해 허용되는 범위 안에서 연구의 실시절차와 자료의 신뢰성을 검증하기 위해 연구윤리심사위원회에서는 자료를 직접 열람할 수 있지만, 이 경우에도 최대한 기밀유지가 되도록 할 것입니다. 귀하께서 이 동의서에 응하시면 이러한 자료의 직접 열람을 허용한다는 것을 의미하며, 연구의 결과가 출판될 경우 귀하의 신원은 비밀 상태로 유지될 것입니다.

13. 연구와 관련한 새로운 정보가 수집되면 연구대상자에게 알려줌

귀하의 조사연구 지속 참여 의지에 영향을 줄 수 있는 새로운 정보가 수집되면 적시에 귀하 또는 대리인에게 알려질 것입니다.

14. 연구 참여를 제한하는 경우 및 해당 사유

귀하는 본 연구에 참여하지 않기로 결정할 자유가 있습니다. 설문조사를 끝까지 작성하지 않을 경우, 귀하의 동의 없이도 귀하의 설문자료는 이 연구에서 제외될 수 있습니다.

15. 연구문의

본 연구에 대해 질문이 있거나 연구 중간에 문제가 생길 시 다음 연구 담당자에게 언제든지 연락하십시오.

연구 책임자(성명): 김규은 (조선대학교)　　전화번호: 010-29**-****

또는 만일 어느 때라도 피험자로서 귀하의 권리에 대한 질문이 있다면 다음의 조선대학교 기관생명윤리위원회에 연락하십시오(익명으로도 가능합니다).

조선대학교 기관생명윤리위원회(IRB)　전화번호: 062-230-6692

조선대학교
CHOSUN UNIVERSITY

동 의 서(학생용)

동의하시기 전에 다음 사항을 다시 한번 확인하여 주시기 바랍니다.

	"예"
1. 본인은 위 연구에 대해 구두로 설명을 받고, 연구대상자 설명문을 읽었으며 담당연구자와 이에 대해 의논하였습니다.	☐
2. 본인은 위험과 이득에 관하여 들었으며, 질문에 만족할 만한 답변을 얻었습니다.	☐
3. 본인은 이 연구에 참여하는 것에 대하여 자발적으로 동의합니다.	☐
4. 본인은 언제든지 연구의 참여를 거부하거나 연구의 참여를 중도에 철회할 수 있고 이러한 결정이 나에게 어떠한 해가 되지 않을 것이라는 것을 알고 있습니다.	☐
5. 본인은 이 동의서에 서명함으로써 나의 개인정보가 현행 법률과 규정이 허용하는 범위 내에서 연구자가 수집하고 처리하는데 동의합니다.	☐
6. 본인은 이 동의서 사본을 받을 것을 알고 있습니다.	☐

연구참여자: (성명) (서명) (서명일) 년 월 일

연구책임자: (성명) 김 규 은 (서명) (서명일) 년 월 일

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Appendix B. Survey for Round 1 of 'Content Validity'

대학수업을 위한 '효과적인 피드백' 측정도구 개발 및 타당화
- 측정도구 개발을 위한 1차 내용타당도 조사 -

안녕하십니까?
바쁘신 와중에 귀중한 시간을 할애해 주셔서 진심으로 감사드립니다.

저는 현재 조선대학교 교육학과 박사과정에 재학 중이며, 박사학위 논문을 위해 대학수업을 위한 '효과적인 피드백' 측정도구를 개발하고 타당성을 검토하고자 합니다.

수업에서 학습자의 성장을 촉진시키는 중요한 요소 중의 하나는 교수자의 피드백입니다. 피드백 유형과 효율적인 제공방식에 대한 연구들은 지속적으로 이루어져 왔지만, 대학교육과 관련한 피드백 연구는 비교적 적은 편이며, 교수자가 제공하는 '효과적인 피드백'과 '피드백 성과'를 측정하는 측정도구가 미흡한 실정입니다.

이러한 배경에서 본 연구에서는 이전 문헌연구와 학생 개방형 설문 데이터를 기반으로 '효과적인 피드백의 특성'과 '피드백 성과'의 범주와 하위요소를 구안하고, 문항을 개발하여 대학수업에서 피드백의 효과성을 진단하기 위한 측정도구를 개발하고자 합니다.
각 범주와 하위요인 산출이 정의에 따라 적절한지를 평가해주시고 문항구성과 내용의 타당성을 검토해주시기 바랍니다. 별도의 의견이 있으실 경우에 의견제시란에 적어주시면 감사하겠습니다.

이 분야에서 풍부한 지식을 가진 교수님의 의견이 매우 중요한 자료가 될 것입니다. 제공해 주신 소중한 의견을 토대로 하여 측정도구 개발에 참고하도록 하겠습니다. 바쁘신 와중에 협조해 주셔서 다시 한번 감사드립니다.

김규은 올림

조선대학교 교육학과 박사과정

조선대학교
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1. 선행연구에 따른 피드백 유형 분류

선행연구에 대한 이론적 고찰을 토대로 피드백 유형별 정의를 제시하면 다음과 같습니다.

<표 1> 선행연구에 따른 피드백의 유형

영역	설명	연구자
정교화/구체적 피드백 (elaborated feedback)	학습자의 이해를 심화하기 위해 정/오답을 확인하고 정답을 제시한 후에 부가적인 설명을 제공한다.	• Bangert-Drowns et al. (1991) • Shute (2008) • Narciss & Huth (2004)
	학습자의 정/오답을 확인하는 것에서 더 나아가 학습자의 수행이 왜 맞는지 또는 틀렸는지에 대한 이유를 설명한다.	• Bruning (2001) • Shute (2008)
	정답제시 후 내용에 대한 부연 설명 또는 예시를 제공하면서 문제해결에 도움을 주는 것이다.	• Bruning (2001) • Shute (2008)
	정/오답 확인을 포한한 힌트와 방향제시가 포함되는 것이다.	• Shute (2008)
촉진적 피드백 (facilitative feedback)	학습자의 학습을 직접적으로 교정해주기 보다는 학습자 스스로가 검토하고 선택할 수 있도록 방향을 제시해주는 것이다. 교수자의 코멘트는 제안적인 특성을 가지고 있으며, 명료화 질문이나 의견제시가 포함된다.	• Black & William (1998) • Underwood & Tregidgo (2006)
긍정적 피드백 (positive feedback)	학습자의 학습과정에 대해서 학습자에게 긍정적인(칭찬, 격려) 반응의 피드백을 제공하는 것이다.	• 이정화 (2018) • Butler (1987) • Cole & Chan (1994) • Smith (1989)
즉각적 피드백 (immediate feedback)	학습자에게 즉시적으로 제공하는 피드백이다.	• 이정화 (2018) • Epstein et al. (2001)

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전문가 점수부여 → 1= 전혀 타당하지 않다, 2= 타당하지 않다, 3= 보통이다, 4= 타당하다, 5= 매우 타당하다

범주	설명	문항 (1= 전혀 아니다, 2= 아니다, 3= 그렇다, 4= 매우 그렇다)	점수	수정사항
정교화 피드백	학생의 수행에서 수정해야할 부분을 꼼꼼하고 자세히 알려주는 것이다. 수행과정에서 잘한 점과 부족한 점을 체크하는 것에서 더 나아가 그 이유를 명확히 설명한다. 학습자의 보다 깊은 이해를 위해 예시를 제공해주거나 학습내용과 관련된 부가적인 정보를 제시한다. 학습자가 어떠한 부분을 수정해야 하는지 명확히 짚어주면서 여기에 대한 해결책을 함께 제공한다.	① 교수님이 주신 피드백은 상세하고 구체적이었다.		
		② 교수님은 내가/학생들이 잘한 점/부족한 점에 대해서 자세히 피드백 해주셨다.		
		③ 교수님은 왜 맞고 틀렸는지에 대한 이유를 명확히 설명해 주셨다.		
		④ 교수님은 내가/학생들이 받은 점수에 대한 이유를 잘 설명해 주셨다.		
		⑤ 교수님은 내가/학생들이 피드백을 잘 이해할 수 있도록 예시(그림, 책 등)를 제공해 주셨다.		
		⑥ 교수님은 수업에서 학생들의 과제를 사례로 보여주시면서 설명해 주셨다.		
		⑦ 교수님은 배우는 내용과 관련된 부가적인 지식도 알려주셨다.		
		⑧ 교수님은 내가/학생들이 과제를 어떻게 수정해야 하는지 꼼꼼히 짚어주셨다.		
		⑨ 교수님이 원하시는 과제의 형식과 틀에 대해서 자세히 설명해 주셨다.		

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전문가 점수부여 → 1= 전혀 타당하지 않다, 2= 타당하지 않다, 3= 보통이다, 4= 타당하다, 5= 매우 타당하다

범주	설명	문항 (1= 전혀 아니다, 2= 아니다, 3= 그렇다, 4= 매우 그렇다)	점수	수정사항
방향 제시 피드백	학습자에게 해결책을 모두 제시해주기 보다는 과제를 수행하는 과정에서 의견과 방향을 제시하지만 강요하지는 않는다. 학생의 사고를 촉진하는 목적으로 수행에 대한 의문점을 제시하거나 내용과 관련하여 질문을 한다.	① 교수님은 내가/학생들이 어려움에 직면했을 때 공부 방법(문제 푸는 방법, 개념 적용법 등)에 대해 안내해 주셨다.		
		② 교수님은 내가/학생들이 과제/수업활동에서 어려움에 직면했을 때 해결 방향을 제시해 주셨다.		
		③ 교수님은 과제물에 대해서 피드백 해주실 때 지시적인 방식이 아니라 "이렇게 하면 어떨까?"와 같이 제안하시는 편이었다.		
		④ 교수님은 과제물에 피드백 해주실 때 내가/학생들이 쓴 글의 내용을 해석하시면서 자신이 맞게 이해한 것인지 확인하는 질문을 하셨다.		
		⑤ 교수님은 나의/학생들의 과제 또는 발언에 대해서 더 명확한 설명을 요청하시거나 자세히 설명할 수 있도록 그 방향을 제시해 주셨다.		
		⑥ 교수님은 무엇이 맞고 틀린지 짚어주시기 보다는 내가/학생들이 스스로 해결할 수 있도록 피드백(힌트, 방향제시) 해주셨다.		
		⑦ 교수님은 다각적인 시각에서 과제물을 바라볼 수 있도록 질문을 던지시는 편이었다.		

전문가 점수부여 → 1= 전혀 타당하지 않다, 2= 타당하지 않다, 3= 보통이다, 4= 타당하다, 5= 매우 타당하다

범주	설명	문항 (1= 전혀 아니다, 2= 아니다, 3= 그렇다, 4= 매우 그렇다)	점수	수정사항
긍정적 피드백	칭찬이나 격려와 같이 수행에 대해 학습자에게 호의적인 반응을 하는 것	① 교수님은 잘한 점에 대해서 칭찬해 주시면서 자신감을 갖게 해주셨다.		
		② 교수님은 틀린 답이어도 혼내지 않고 격려하는 방식으로 피드백 해주셨다.		
		③ 교수님은 나의/학생들의 수행에 대해서 격려를 해주셨다.		
		④ 교수님의 피드백에서 나의/학생들의 의견을 지지해 주신다는 것을 느꼈다.		
		⑤ 교수님은 보완할 점 외에 장점에 대해서도 늘 피드백 해주셨다.		

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즉각적 피드백	과제가 끝난 직후 또는 학습과정에서 즉각적으로 제공되는 피드백	① 교수님은 제출된 과제물에 코멘트를 적어서 빠른 시일 내에 돌려주셨다.		
		② 교수님은 시험지에 코멘트를 적어서 빠른 시일 내에 돌려주셨다.		
		③ 교수님은 시험답안에 대한 풀이를 빠른 시일 내에 해주셨다.		
		④ 내가/학생들이 이해되지 않은 부분에 대해서 카카오톡/이메일/문자 등을 통해서 문의하면 교수님이 즉각적으로 답변을 해주셨다.		
		⑤ 교수님은 내가/학생들이 공부에 어려움을 느낄 때 즉각적으로 해결책을 제공해 주셨다.		

※ 범주와 문항에 대한 전반적인 의견을 자유롭게 기술하여 주십시오.

의견란

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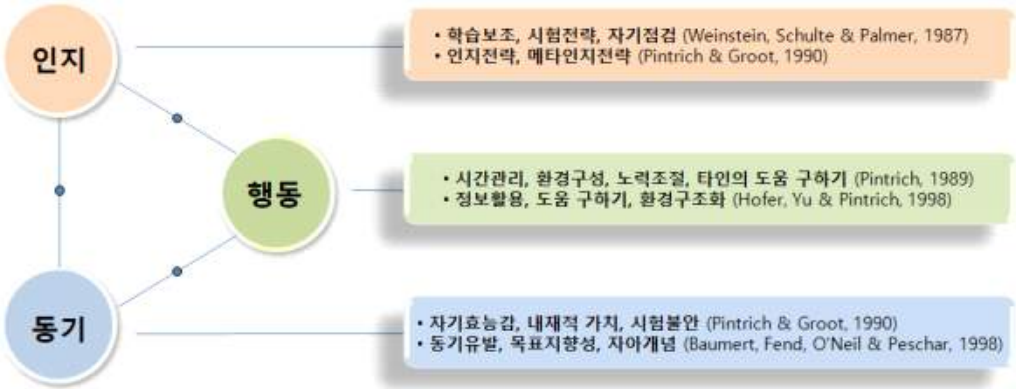
2. 피드백 성과에 대한 검사도구 문항



전문가 점수부여 → 1: 전혀 타당하지 않다, 2: 타당하지 않다, 3: 보통이다, 4: 타당하다, 5: 매우 타당하다

범주	설명	하위요소	문항	점수	수정사항
인지	학습을 전반적으로 이해하는 과정이 해당된다. 학습내용을 이해하고 과제/수업에서 학습자가 자신의 부족한 부분을 알게 되는 과정이 해당된다. 학습을 전반적으로 이해하는 것에서 더 나아가 학습내용과	이해/학습도움	① 교수님의 피드백은 수업/학습내용을 이해하는 데에 도움이 되었다.		
			② 교수님의 피드백은 공부(시험/과제/연습)하는 데에 도움이 되었다.		
			③ 교수님의 피드백을 통해서 이전에 이해가 안 되었던 부분을 이해할 수 있었다.		
			④ 교수님의 피드백을 통해서 문제의 핵심을 파악할 수 있었다.		
			⑤ 교수님의 피드백을 통해서 비슷한 개념을 잘 구분할 수 있게 되었다.		

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	관련하여 제공받은 정보를 토대로 미래의 비슷한 학습상황에서도 응용하는 것과 학습방법을 터득하는 과정이 포함된다.	전이/파지	⑥ 교수님이 제공해주신 피드백을 활용하여 다음 과제에 적용하였다.		
			⑦ 교수님이 제공해주신 피드백을 다른 과목에도 적용시키고자 하였다.		
			⑧ 교수님의 피드백을 다른 학습상황에서도 떠올려보았다.		
			⑨ 교수님이 제공해주신 피드백을 시험에서 적용시킬 수 있었다.		
			⑩ 교수님의 피드백으로 인해 같은 실수를 반복하지 않게 되었다.		
		학습전략	⑪ 교수님의 피드백을 통해서 내가 어떤 부분을 공부해야 하는지 알 수 있었다.		
			⑫ 교수님의 피드백을 통해서 문제해결 방법을 알게 되었다.		
			⑬ 교수님의 피드백을 통해서 효율적인 학습방법(과제, 시험)을 터득하는 데 도움이 되었다.		
			⑭ 교수님의 피드백을 통해서 문제를 푸는 속도가 빨라졌다.		
			⑮ 교수님의 피드백을 통해서 발표/과제를 준비하는 데 수월해졌다.		

전문가 점수부여 → 1: 전혀 타당하지 않다, 2: 타당하지 않다, 3: 보통이다, 4: 타당하다, 5: 매우 타당하다

범주	설명	하위요소	문항	점수	수정사항
메타인지	학습과 문제 해결의 근본적인 차원으로 자신을 객관적인 관점에서 바라보고, 학습의 이해도와 수행을 다시 점검하며, 이를 기반으로 상황 또는 문제를 분석하는 사고과정이다.	자기성찰	① 교수님의 피드백은 나 자신을 돌아보게 하였다.		
			② 교수님의 피드백은 나의 수행에 대해서 다시 한번 생각해 볼 수 있게 하였다.		
			③ 교수님의 피드백을 통해서 문제에 접근하는 나의 태도가 변화하였다.		
			④ 교수님의 피드백을 통해서 나 스스로를 더 객관적으로 바라보는 시선을 갖게 되었다.		
			⑤ 교수님의 피드백을 통해서 내 실수의 원인을 찾고자 하였다.		
		점검	⑥ 교수님의 피드백을 통해서 내가 무엇을 알고 모르는지 알게 되었다.		
			⑦ 교수님의 피드백을 통해서 내가 놓치고 있는 부분이 없는지 점검하게 되었다.		
			⑧ 교수님의 피드백의 도움으로 내가 어떠한 부분을 더 공부해야 하는지 검토하게 되었다.		

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			⑨ 교수님의 피드백을 통해서 어떠한 문제/내용에 대해서 더욱 심도 있게 분석하게 되었다.		
			⑩ 교수님의 피드백을 통해서 다각적인 관점에서 문제를 바라보고자 하였다.		

전문가 점수부여 → 1: 전혀 타당하지 않다, 2: 타당하지 않다, 3: 보통이다, 4: 타당하다, 5: 매우 타당하다

범주	설명	하위요소	문항	점수	수정사항
행동 조절	자신의 목표를 위해 행동으로 옮기는 힘이다. 과제가 어려워도 끝까지 수행하고자 노력을 하면서, 학습을 효율적으로 진행하기 위해 시간을 맞게 분배한다. 또한, 학습과정에서 어려움을 느낄 경우에 도움을 요청하는 행동도 포함된다.	노력/집중	① 교수님의 피드백을 받은 이후로 나는 수업을 더욱 집중해서 듣게 되었다.		
			② 교수님의 피드백을 받은 이후로 나는 더욱 열심히 수업에 참여하게 되었다.		
			③ 교수님의 피드백을 받은 이후로 과제의 부족한 점을 끝까지 고쳐나가고자 노력하였다.		
			④ 교수님의 피드백을 받은 이후로 나는 내 과제에 더욱 성실히 임하고자 하였다.		
			⑤ 교수님의 피드백이 불편하더라도 이를 수용하도록 노력하였다.		
		시간	⑥ 교수님의 피드백을 통해서 학습 시 내가 어떤 부분에 시간을 더 할애해야 하는지 알게 되었다.		
			⑦ 교수님의 피드백을 통해서 학습할 때 시간을 절약할 수 있었다.		
			⑧ 교수님의 피드백을 통해서 문제해결에 소요되는 시간을 절약할 수 있었다.		
			⑨ 교수님의 피드백을 통해서 학습 시 시간을 효율적으로 활용할 수 있었다.		
			⑩ 교수님의 피드백을 통해서 시험/발표를 위한 준비를 체계적으로 계획할 수 있었다.		
		도움요청	⑪ 교수님의 피드백을 받은 이후로 교수님에게 다시 도움을 요청하는 데 어려움이 없었다.		
			⑫ 교수님의 피드백을 받은 이후로 나는 공부하다 이해 안 되는 내용에 대해서 이메일/카카오톡/문자 등의 수단으로 교수님에게 문의하였다.		
			⑬ 교수님의 피드백을 받은 이후로 이해 안 되는 내용에 대해서 질문하기 위해 교수님을 자주 찾아가게 되었다.		
			⑭ 교수님의 피드백을 받은 이후로 수업에서 질문을 더 많이 하게 되었다.		
			⑮ 교수님의 피드백을 받은 이후로 도움을 받고자 학습내용과 관련된 자료를 찾아보게 되었다.		

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전문가 점수부여 → 1: 전혀 타당하지 않다, 2: 타당하지 않다, 3: 보통이다, 4: 타당하다, 5: 매우 타당하다

범주	설명	하위요소	문항	점수	수정사항
동기	내재적 동기, 수업관심, 자아효능감, 가치인식 등의 동기적 특성이 해당되며, 앞으로의 행동을 좌우하는 등 학습자의 선택에 영향을 미친다.	내재적 동기	① 교수님의 피드백을 통해서 과목에 대한 흥미와 관심이 높아졌고 내용을 더욱 깊이 이해하고 싶어졌다.		
			② 교수님의 피드백을 받으면서 수업에 참여하는 게 즐거워졌다.		
			③ 교수님의 피드백은 나에게 동기부여가 되었다.		
			④ 교수님의 피드백을 통해서 수업에 적극적인 자세를 갖게 되었다.		
			⑤ 교수님이 피드백을 주셔서 더욱 즐겁게 공부할 수 있었다.		
		자아효능감/자신감	⑥ 교수님이 칭찬/격려를 해주셔서 나에 대한 확신이 생겼다.		
			⑦ 교수님의 피드백을 통해서 평소에 자신이 없었던 부분에 대한 자신감이 생겼다.		
			⑧ 교수님의 피드백을 통해서 과제/발표/시험 등에 대한 자신감이 생겼다.		
			⑨ 교수님의 피드백을 통해서 과제/발표/시험 등을 더욱 잘 해낼 수 있을 것 같았다.		
			⑩ 교수님의 피드백을 통해서 과제/발표/시험에 대한 불안감이 낮아졌다.		

※ 범주와 문항에 대한 전반적인 의견을 자유롭게 기술하여 주십시오.

의견란

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■ 마지막으로...

교수님의 귀중한 시간을 할애하여 내용타당도 조사에 협조해 주신 점에 감사드리며, 소액이지만 교수님의 노고에 보답하고자 합니다. 사례비를 지급해드리기 위해 아래 교수님의 정보를 기재해주시면 감사하겠습니다.

성명	직위(급)	은행명	계좌번호

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Appendix C. Survey for Round 2 of Content Validity

대학수업을 위한 '효과적인 피드백' 측정도구 개발 및 타당화
- 제 2차 내용타당도 조사 -

안녕하십니까?

지난 1차 전문가 내용 타당도 조사를 마치고 2차 설문을 실시하고자 합니다. 바쁘신 와중에도 귀중한 시간을 내어주시어 '대학수업을 위한 효과적인 피드백 측정도구 개발 및 타당화' 연구의 2차 전문가 내용타당도 조사에 참여해 주셔서 진심으로 감사드립니다. 2차 전문가 내용타당도 설문지는 교수님께서 보내주신 다양한 의견을 정리하고 반영하여 작성되었습니다.

본 조사는 대학수업을 위한 효과적인 피드백 유형과 성과를 규명하고, 이를 교육상황에서 측정할 수 있는 측정도구를 개발하여 피드백의 질을 향상시키는 데에 도움이 될 것입니다.

각 범주와 하위요인 산출이 정의에 따라 적절한지를 평가해주시고 문항구성과 내용의 타당성을 검토해주시기 바랍니다. 별도의 의견이 있으실 경우에 의견제시란에 적어주시면 감사하겠습니다.

응답하신 내용은 연구목적 이외의 다른 용도로 사용되지 않을 것을 약속드립니다.
바쁘신 와중에 협조해 주셔서 다시 한 번 감사드립니다.

조선대학교 일반대학원
교육심리전공(지도교수 김민성)
김규은 올림
메일주소: gyueunkim84@gmail.com

조선대학교
CHOSUN UNIVERSITY

대학수업을 위한 '효과적인 피드백' 측정도구 개발을 위한 모형(Framework)

영역	범주	하위요인	내용	저자
피드백 유형	피드백 내용	1 **정교화 피드백** (Elaborated feedback)	• 학습자의 정/오답을 확인하는 것에서 더 나아가 학습자의 수행이 왜 맞는지 또는 틀렸는지에 대한 이유를 설명하거나 정답제시 후 내용에 대한 부연설명 또는 예시를 제공하면서 문제해결에 도움을 주는 것 • 현재 수행 수준과 이상적인 수준 사이의 차이를 확인하여 학습 개선을 위한 방법을 제시하는 피드백	Brooks et al. (2009) Bruning (2001) Fong et al. (2009) Shute (2008)
		2 **촉진적 피드백** (Facilitative feedback)	• 정답을 가르쳐주기보다 힌트를 제공하여 스스로 과제를 개선할 수 있도록 유도하는 피드백 • 명료화 질문, 열린 질문, 확인적 질문을 통해 학습자의 이해를 파악하고 재구성하도록 도움을 주는 피드백 • 특정한 답을 강압적으로 요구하거나 지시적인 방식이 아니라 학생이 선택할 수 있는 기회를 주면서 제공하는 제안적인 형식의 피드백	Finn & Metcalfe (2010) Straub (1996) Adie et al., (2018) Tan et al., (2019)
		3 **격려 피드백** (Acknwoledging feedback)	• 학습자의 학습과정에 대해서 학습자에게 긍정적인(칭찬, 격려) 반응을 제공하는 피드백 • 학생의 진술을 지지(confirm)하는 피드백 • 학생을 인격체로 인정 및 존중하는 등 관심의 표현을 겸하는 피드백	Butler (1987) Cole & Chan (1994) Smith (1989) Mercer (2004)
		4 **대화적 피드백** (Interactive feedback)	• 지식형성과 이해를 위해 쌍방향적으로 이루어지는 대화 및 상호작용적 피드백 방법 • 진술내용의 의미가 명확히 드러나도록 재구성하여 알려주는 피드백	Steen-Utheim (2019) Yang & Carless (2013)
		5 **시기적절 피드백** (Timely feedback)	• 피드백에 대한 학습자의 관심이 깨어있는 시점으로 적절한 시기에 피드백을 제공하는 방법	Epstein et al. (2001) Haughney et al. (2020)

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영역	범주	하위요인	내용	저자
피드백 효과성	인지	1 이해/학습도움	학습내용을 기억하고 이해하는 데 사용되는 전략	Zimmerman (1990) Zimmerman & Pons (1988) Weinstein, Schulte, & Palmer (1987) Schunk (2005) Vollmeyer & Rheinberg (2006)
		2 학습방법	학습목표를 달성하기 위해 필요한 인지전략, 메타인지전략, 정의적 및 동기적 전략을 적절히 조율하고 활용하는 전략	
		3 자기성찰	자신의 이해 정도를 확인하는 메타인지적 전략	
	행동조절	4 노력	성공적으로 학습을 지속하기 위해 기울이는 노력	
		5 도움요청	성공적으로 학습을 지속하기 위해 주변에 도움을 요청하는 행동	
	동기	6 자율적 동기	과제에 대한 목적, 과제의 흥미와 중요성에 대한 신념	
		7 자아효능감/자신감	자신의 능력에 대해 가지는 기대	

[수정 - 정교화 피드백]

피드백 내용	1. 정교화 피드백 교수님은 학생의 과제나 활동, 발표에 대해서...	타당도 2차 응답 1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 잘한 점/부족한 점을 자세히 피드백해주셨다.					
	② 어떤 점에서 맞고 틀렸는지의 이유를 자세히 설명해주셨다.					
	③ 평가 점수나 성적에 대한 근거에 대해 자세히 설명해주셨다. 추가					
	④ 우수한 사례를 예시로 보여주시면서 자세히 피드백해주셨다.					
	⑤ 정답이나 모범 답안이 도출되는 과정에 대해 학생에게 자세히 설명해 주셨다.					
	⑥ 과제를 어떻게 수정해야 하는지 알려주셨다.					
	⑦ 원하시는 과제의 형식과 틀에 대해서 자세히 알려주셨다. 추가					
	⑧ 효율적인 과제 및 활동 방법(문제 푸는 방법, 개념 적용법 등)에 대해 알려주셨다.					
	⑨ 교수님은 배운 내용을 어떻게 다양한 상황에서 적용할 수 있을지에 대한 방법을 알려주셨다.					
전문가 의견	① 의견:	☐ 문항 삭제				
	② 의견:	☐ 문항 삭제				
	③ 의견:	☐ 문항 삭제				
	④ 의견:	☐ 문항 삭제				
	⑤ 의견:	☐ 문항 삭제				
	⑥ 의견:	☐ 문항 삭제				
	⑦ 의견:	☐ 문항 삭제				
	⑧ 의견:	☐ 문항 삭제				
	⑨ 의견:	☐ 문항 삭제				

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[추가 - 촉진적 피드백]

피드백 내용	2. 촉진적 피드백 교수님은 수업활동이나 과제 코멘트에서...	타당도 2차 응답 1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 학생 스스로가 해결책을 찾을 수 있도록 단서(실마리)를 제공해 주셨다.					
	② 무엇이 맞고 틀렸는지 알려주시기 보다는 학생 스스로 수정할 수 있도록 단서(실마리)를 제공해 주셨다.					
	③ 어떠한 문제 또는 내용에 관한 학생의 의견을 물어보셨다. 추가					
	④ 학생의 생각을 더 자세히 설명해볼 것을 요청하셨다.					
	⑤ 지시적인 방식이 아니라 "이렇게 하면 어떨까?"와 같이 제안하시는 편이었다.					
	⑥ 학생의 선택을 존중하되, 조언의 방식으로 피드백을 제공해 주셨다. 추가					
	⑦ 학생의 생각을 인정해주면서 사려깊은 어조로 피드백을 제공해 주셨다. 추가					
전문가 의견	① 의견:	☐ 문항 삭제				
	② 의견:	☐ 문항 삭제				
	③ 의견:	☐ 문항 삭제				
	④ 의견:	☐ 문항 삭제				
	⑤ 의견:	☐ 문항 삭제				
	⑥ 의견:	☐ 문항 삭제				
	⑦ 의견	☐ 문항 삭제				

[수정 - 격려 피드백]

피드백 내용	3. 격려 피드백 교수님은 학생의 과제나 활동, 발표에 대한 피드백에서...	타당도 2차 응답 1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 성과나 결과에 대해 칭찬/인정해 주셨다.					
	② 수행 및 발전과정을 인정/격려해 주셨다.					
	③ 학생이 최선을 다하는 모습을 칭찬해 주셨다. 추가					
	④ 약점보다는 장점이 돋보이게끔 격려해 주셨다.					
	⑤ 학생을 응원하는 메시지를 전해주셨다. 추가					
	⑥ 학생의 의견에 대한 관심을 관심을 보여주셨다. 추가					
전문가 의견	① 의견:	☐ 문항 삭제				
	② 의견:	☐ 문항 삭제				
	③ 의견:	☐ 문항 삭제				
	④ 의견:	☐ 문항 삭제				
	⑤ 의견:	☐ 문항 삭제				
	⑥ 의견:	☐ 문항 삭제				

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[추가 - 대화적 피드백]

피드백 내용	4. 대화적 피드백 교수님은...		타당도 2차 응답 1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 피드백을 주실 때, 그에 대해 학생들과 의견을 주고받을 수 있는 기회를 제공해 주셨다.	추가					
	② 지속적인 대화와 상호작용을 통해 피드백을 이해하게끔 유도하셨다.	추가					
	③ 일방적인 방식이 아닌 쌍방향의 의사소통을 통해서 피드백을 제공해 주셨다.	추가					
	④ 학생의 적극적인 참여를 위해 지속적으로 학생의 의견을 확인하면서 피드백을 제공해 주셨다.	추가					
	⑤ 피드백에 대한 학생의 질문이나 의견을 보충해 주시거나 더 상세한 설명을 제공하시는 등 피드백에 대한 대화의 기회를 제공해 주셨다.	추가					
	⑥ 학생이 말하고자 하는 의미가 더욱 자세히 드러나도록 다시 진술해 주셨다.	추가					
	⑦ 학생이 제기한 의견을 다른 학생들이 이해할 수 있도록 다시 제시해 주셨다.	추가					
전문가 의견	① 의견:		☐ 문항 삭제				
	② 의견:		☐ 문항 삭제				
	③ 의견:		☐ 문항 삭제				
	④ 의견:		☐ 문항 삭제				
	⑤ 의견:		☐ 문항 삭제				
	⑥ 의견:		☐ 문항 삭제				
	⑦ 의견:		☐ 문항 삭제				

[수정 - 적시적 피드백]

피드백 내용	5. 적시적 피드백 교수님은...		타당도 2차 응답 1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 제출된 과제물/시험지/답안지에 대해 피드백을 제공한 후 빠른 시일 내에 돌려주셨다.						
	② 제출된 시험지/답안지를 수업에서 돌려주신 직후 피드백을 제공해 주셨다.	추가					
	③ 수업에서 학생의 발언이나 발표에 대해 즉각적으로 피드백을 제공해주셨다.	추가					
	④ 내가 궁금하거나 모르는 점이 있어 교수님에게 연락했을 때 1-2일 이내에 피드백을 주셨다.	추가					
	⑤ 학생들의 질문이나 어려움에 대해 비교적 빠른 시일 내에 답변이나 조언을 제공해 주셨다.						

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전문가 의견	① 의견:	□ 문항 삭제
	② 의견:	□ 문항 삭제
	③ 의견:	□ 문항 삭제
	④ 의견:	□ 문항 삭제
	⑤ 의견:	□ 문항 삭제

[수정 - 이해/학습도움]

인지	1. 이해/학습도움		타당도 2차 응답				
			1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 교수님의 피드백은 수업/학습내용을 이해하는 데에 도움이 되었다.						
	② 교수님의 피드백은 수업/학습의 목표를 파악하는 데에 도움이 되었다.						
	③ 교수님의 피드백은 공부(시험/과제/복습)할 때 도움이 되었다.						
	④ 교수님의 피드백을 통해 나의 답이 왜 틀렸는지 이해할 수 있었다.	추가					
	⑤ 교수님의 피드백을 통해 내 수행에 필요한 지식과 정보를 알게 되었다.	추가					
전문가 의견	① 의견:		□ 문항 삭제				
	② 의견:		□ 문항 삭제				
	③ 의견:		□ 문항 삭제				
	④ 의견:		□ 문항 삭제				
	⑤ 의견:		□ 문항 삭제				

[수정 - 전이]

인지	2. 전이		타당도 2차 응답				
			1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 교수님이 제공해주신 피드백을 활용하여 다음 과제에 적용하였다.						
	② 교수님이 제공해주신 피드백을 다른 과목에도 적용하였다.						
	③ 교수님이 제공해주신 피드백을 활용하여 다른 학습(과제, 시험, 공부 등)상황에서도 떠올려보았다.						
	④ 교수님이 제공해주신 피드백을 시험에 적용하였다.						
	⑤ 교수님이 제공해주신 피드백을 활용하여 같은 실수를 반복하지 않게 되었다.						

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전문가 의견	① 의견:	□ 문항 삭제
	② 의견:	□ 문항 삭제
	③ 의견:	□ 문항 삭제
	④ 의견:	□ 문항 삭제
	⑤ 의견:	□ 문항 삭제

[수정 - 학습방법] 학습전략 -> 학습방법

인지	3. 학습방법		타당도 2차 응답				
			1	2	3	4	5
			매우 낮음	낮음	보통	높음	매우 높음
2차 문항	① 교수님의 피드백을 통해 내가 어떻게 공부해야 하는지 알 수 있었다.						
	② 교수님의 피드백을 통해 효율적인 학습/문제해결 방법(과제, 시험)을 터득하는 데 도움이 되었다.						
	③ 교수님의 피드백을 통해 문제를 푸는 시간을 줄일 수 있게 되었다.						
	④ 교수님의 피드백은 과제/발표를 준비하는 데 도움이 되었다.						
	⑤ 과제를 시작하기 전에 교수님의 피드백을 먼저 떠올려보게 되었다.	추가					
전문가 의견	① 의견:		□ 문항 삭제				
	② 의견:		□ 문항 삭제				
	③ 의견:		□ 문항 삭제				
	④ 의견:		□ 문항 삭제				
	⑤ 의견:		□ 문항 삭제				

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[수정 - 노력]

행동조절	5. 노력		타당도 2차 응답				
			1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 교수님의 피드백을 받은 이후로 나는 수업을 더욱 집중해서 듣게 되었다.						
	② 교수님의 피드백을 받은 이후로 나는 더욱 열심히 수업에 참여하게 되었다.						
	③ 교수님의 피드백을 받은 이후로 과제의 부족한 점을 끝까지 고쳐나가고자 노력하였다.						
	④ 교수님의 피드백을 받은 이후로 과제가 어렵거나 내가 좋아하지 않는 과제여도 끝까지 실행하고자 노력하였다.	추가					
	⑤ 교수님의 피드백을 받은 이후로 피드백을 나의 수행/과제에 반영하고자 노력하였다.	추가					
전문가 의견	① 의견:		☐ 문항 삭제				
	② 의견:		☐ 문항 삭제				
	③ 의견:		☐ 문항 삭제				
	④ 의견:		☐ 문항 삭제				
	⑤ 의견:		☐ 문항 삭제				

[수정 - 도움요청]

행동조절	6. 도움요청		타당도 2차 응답				
			1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 교수님의 피드백을 받은 후 교수님에게 다시 도움을 요청하는 것이 수월해졌다.						
	② 교수님의 피드백을 받은 후 수업에서 더 많은 질문을 하게 되었다.						
	③ 교수님의 피드백을 받기 위해 면담을 요청하거나 비대면의 방식으로 문의하게 되었다.	추가					
	④ 교수님의 피드백을 받은 이후로 학습내용과 관련된 자료를 찾아보게 되었다.						
	⑤ 교수님의 피드백을 받은 이후로 피드백이 이해가 안 되었을 경우에 교수님에게 면담을 요청하는 등 적극적인 자세를 가지게 되었다.	추가					
전문가 의견	① 의견:		☐ 문항 삭제				
	② 의견:		☐ 문항 삭제				
	③ 의견:		☐ 문항 삭제				
	④ 의견:		☐ 문항 삭제				
	⑤ 의견:		☐ 문항 삭제				

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[수정 - 자율적 동기] 내재적 동기 -> 자율적 동기

동기	7. 자율적 동기		타당도 2차 응답				
			1 매우 낮음	2 낮음	3 보통	4 높음	5 매우 높음
2차 문항	① 교수님의 피드백은 과목에 대한 흥미와 관심을 가지도록 이끌어주었다.						
	② 교수님의 피드백은 수업과 관련된 분야에 대해 흥미를 가지게 하였다.						
	③ 교수님의 피드백 덕분에 나의 배움과 성장에서 차지하는 수업의 가치를 알게 되었다.	추가					
	④ 교수님의 피드백은 적극적인 수업 참여를 유도하였다.						
	⑤ 교수님의 피드백으로 인해 더 열심히 노력하고자 하는 동기가 생겼다.	추가					
전문가 의견	① 의견:		□ 문항 삭제				
	② 의견:		□ 문항 삭제				
	③ 의견:		□ 문항 삭제				
	④ 의견:		□ 문항 삭제				
	⑤ 의견:		□ 문항 삭제				

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Appendix D. Survey for the pilot test

대학수업을 위한 '효과적인 피드백' 측정도구 개발 및 타당화

안녕하십니까?
본 연구에서는 학생들의 학업과 성장에 도움을 주는 효과적인 피드백의 특성을 파악하여 대학수업을 위한 '효과적인 피드백' 측정도구를 개발하고자 합니다. 여러분의 답변은 대학교육의 개선을 위한 소중한 자료로 활용될 것입니다.

수집된 자료는 익명으로 분석에 사용되며, 연구 이외의 목적으로 사용하지 않을 것입니다. 본 설문에 대한 응답과 관련하여 옳고 그름이 없으며, 여러분이 느끼는 생각을 정확하게 표현해주시는 것이 가장 좋은 자료가 될 수 있으니 모든 문항에 솔직하게 답변해 주시기 바랍니다.

응답 시간은 약 15분에서 20분정도 소요될 예정이며, 조사 결과는 연구목적으로만 활용할 것을 약속드립니다.

설문지를 끝까지 응답해 주시고 성실히 답변해 주신 분들에게 모바일 상품권 5,000원권을 보내드리도록 하겠습니다. 설문을 완료하신 후 휴대폰 번호를 남겨주세요.

본 설문조사에 소중한 시간을 내주신 것에 대해 진심으로 감사드립니다.

조선대학교 일반대학원
교육심리전공
김규은

※ 본 조사와 관련하여 문의 사항이 있으시면 아래의 연락처로 연락 주십시오.

김규은
010-2***-****
E-mail: gyueunkim84@gmail.com

조선대학교
CHOSUN UNIVERSITY

이제부터 설문을 시작하겠습니다. 의미 있는 연구가 될 수 있도록 여러분의 솔직하고 성실한 응답 부탁드립니다. :)

※ 귀하의 기본정보를 묻는 문항입니다.

2. 귀하의 성별은?

① 남자 ② 여자

3. 귀하의 학년은?

① 1학년 ② 2학년 ③ 3학년 ④ 4학년 ⑤ 5학년 이상

4. 귀하의 소속 학과를 적어주세요.

_____

5. 이 설문조사를 실시하고 있는 수업의 과목명을 적어주세요.

_____

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✓ 해당하는 곳에 체크해 주세요.

교수님은 학생의 과제나 활동, 발표에 대해서…		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
1. 잘한 점/부족한 점을 구체적으로 피드백을 해주신다.	→	①	②	③	④
2. 어떤 부분이 적절하고 부적절한지 그 이유를 구체적으로 설명해 주신다.	→	①	②	③	④
3. 평가 점수나 성적에 관련한 근거를 구체적으로 제공해 주신다.	→	①	②	③	④
4. 학생의 과제나 활동에 구체적인 예시를 보여주시면서 피드백을 제공해 주신다.	→	①	②	③	④
5. 정답에 이르는 과정에 대해 학생에게 구체적으로 설명해 주신다.	→	①	②	③	④
6. 과제를 어떻게 수정해야 하는지에 대한 방향을 구체적으로 알려주신다.	→	①	②	③	④
7. 나의 과제가 교수님께서 원하시는 과제의 형식과 틀에 부합한지에 대해서 구체적으로 알려주신다.	→	①	②	③	④

✓ 해당하는 곳에 체크해 주세요.

교수님은…		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
8. 수업 활동이나 과제에서 학생이 스스로 해결책을 찾을 수 있도록 단서(실마리)를 제공해 주신다.	→	①	②	③	④
9. 학생이 무엇이 맞고 틀렸는지를 스스로 찾을 수 있도록 힌트를 제공해 주신다.	→	①	②	③	④
10. 학생이 활동/과제를 스스로 개선할 수 있도록 문제 또는 학습내용에 대해 질문하신다.	→	①	②	③	④
11. 학생이 활동/과제를 스스로 개선할 수 있도록 학생의 생각에 대해 더 자세히 설명해볼 것을 요청하신다.	→	①	②	③	④
12. 활동/과제를 수정하는 대략적인 방향을 제시해주시면서 구체적인 방법은 학생이 스스로 고민하게 하신다.	→	①	②	③	④

✓ 해당하는 곳에 체크해 주세요.

교수님은 학생의 과제나 활동, 발표에 대한 피드백에서…		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
13. 학생의 노력을 격려하기 위해 수행 및 발전과정에 대해 인정/칭찬해 주신다.	→	①	②	③	④
14. 학생의 생각을 인정해주면서 사려깊은 어조로 피드백해주신다.	→	①	②	③	④
15. 틀린 답이어도 혼내지 않고 격려하는 방식으로 피드백해주신다.	→	①	②	③	④
16. 부족한 부분을 지적하면서도 학생의 장점도 함께 인정해주신다.	→	①	②	③	④
17. 학생을 응원하는 메시지를 전해주신다.	→	①	②	③	④
18. 학생의 감정을 고려하면서 피드백을 제공해 주신다.	→	①	②	③	④

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✓ 해당하는 곳에 체크해 주세요.

교수님은…		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
19. 피드백에 대해 학생들과 의견을 주고받을 수 있는 기회를 제공해 주신다.	→	①	②	③	④
20. 피드백을 제공하실 때 학생이 의견을 충분히 말할 수 있도록 기회를 제공해 주신다.	→	①	②	③	④
21. 피드백을 제공하실 때 피드백에 대한 학생의 의견을 파악하고자 하신다.	→	①	②	③	④
22. 피드백 제공 후 학생의 피드백에 대한 이해정도를 확인하기 위해 질의응답의 기회를 제공해 주신다.	→	①	②	③	④
23. 피드백에 대한 학생의 생각을 확인하기 위해 논의할 기회를 주신다.	→	①	②	③	④
24. 피드백을 제공하실 때 학생이 말하고자 하는 의미를 더욱 자세히 드러날 수 있도록 다시 진술해 주시고 학생의 의견을 구하신다.	→	①	②	③	④
25. 학생이 발언을 할 때 질의/응답을 통해 학생의 생각이 명확해지도록 하신다.	→	①	②	③	④

✓ 해당하는 곳에 체크해 주세요.

교수님은…		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
26. 피드백 코멘트가 적힌 과제물/시험지/답안지를 빠른 시일 내에 확인할 수 있게 하신다.	→	①	②	③	④
27. 시험/퀴즈를 마친 뒤 빠른 시일 내에 수업에서 시험/퀴즈에 관해 피드백을 주신다.	→	①	②	③	④
28. 수업에서 학생의 발언이나 발표에 대해 즉각적으로 피드백을 제공해 주신다.	→	①	②	③	④
29. 학생이 과제나 시험에 대한 피드백을 요청하면 교수님은 빠른 시일 내에 피드백을 제공해 주신다.	→	①	②	③	④
30. 학생이 학습내용에 대한 질문이 있거나 어려움이 있을 때 비교적 빠른 시일 내에 답변이나 조언을 해주신다.	→	①	②	③	④

✓ 해당하는 곳에 체크해 주세요.

문항		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
1. 교수님의 피드백은 수업/학습내용을 이해하는 데에 도움이 되었다.	→	①	②	③	④
2. 교수님의 피드백은 수업/학습의 목표를 파악하는 데에 도움이 되었다.	→	①	②	③	④
3. 교수님의 피드백은 공부할 때 학습계획을 수립하는 데에 도움이 되었다.	→	①	②	③	④
4. 교수님의 피드백을 통해 내 수행에 필요한 지식과 정보를 알게 되었다.	→	①	②	③	④
5. 다음 과제를 할 때 교수님이 제공해 주신 피드백을 활용할 수 있을 것 같다.	→	①	②	③	④
6. 다른 과목에서도 교수님이 제공해 주신 피드백을 활용할 수 있을 것 같다.	→	①	②	③	④

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문항		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
7. 교수님이 제공해 주신 피드백을 통해 같은 실수를 반복하지 않을 것 같다.	→	①	②	③	④
8. 교수님의 피드백을 통해 내가 어떻게 공부해야 하는지 알 수 있었다.	→	①	②	③	④
9. 교수님의 피드백을 통해 효율적인 학습/문제해결 방법(과제, 시험)을 터득하는 데 도움이 되었다.	→	①	②	③	④
10. 교수님의 피드백을 통해 시험을 효과적으로 준비하는 데에 도움이 되었다.	→	①	②	③	④
11. 과제를 수행할 때 교수님이 이전에 주신 피드백을 떠올려보게 되었다.	→	①	②	③	④
12. 교수님의 피드백은 과제/수업활동/발표를 준비하는 데 도움이 되었다.	→	①	②	③	④
13. 교수님의 피드백을 통해 내가 무엇을 알고 모르는지 확인하게 되었다.	→	①	②	③	④
14. 교수님의 피드백을 통해 나의 수행에 대해서 다시 생각하게 되었다.	→	①	②	③	④
15. 교수님의 피드백을 통해 과제에서 내가 놓치거나 빼놓은 부분이 없는지 점검하게 되었다.	→	①	②	③	④
16. 교수님의 피드백을 통해 나 스스로를 더 객관적으로 바라보게 되었다.	→	①	②	③	④
17. 교수님의 피드백을 통해 나의 강점과 약점이 무엇인지 파악하게 되었다.	→	①	②	③	④
18. 교수님의 피드백을 통해 나의 글이나 생각에 대해 성찰하게 되었다.	→	①	②	③	④
19. 교수님의 피드백을 받은 이후로 나는 수업에 더욱 집중하게 되었다.	→	①	②	③	④
20. 교수님의 피드백을 받은 이후로 나는 수업을 더욱 열심히 하게 되었다.	→	①	②	③	④
21. 교수님의 피드백을 받은 이후로 과제의 부족한 점을 고쳐나가고자 노력하였다.	→	①	②	③	④
22. 교수님의 피드백을 받은 이후로 과제가 어렵거나 내가 좋아하지 않는 과제여도 끝까지 수행하고자 노력하였다.	→	①	②	③	④
23. 나는 이후의 수행이나 과제에 교수님의 피드백을 반영하고자 노력하였다.	→	①	②	③	④
24. 교수님의 피드백을 받은 후에 교수님에게 도움을 요청하는 것이 수월해졌다.	→	①	②	③	④
25. 교수님의 피드백을 받은 후에 수업에서 더 많은 질문을 하게 되었다.	→	①	②	③	④

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✓ 해당하는 곳에 체크해 주세요.

문항		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
26. 교수님의 피드백을 받은 후에 활동/과제 수행과정에서 교수님의 도움이 필요할 때 면담을 요청하게 되었다.	→	①	②	③	④
27. 교수님의 피드백을 받은 후에 필요한 자료나 과제 수행방법에 대해 교수님께 문의하게 되었다.	→	①	②	③	④
28. 교수님의 피드백이 이해가 안 되었을 경우에 교수님에게 물어보게 되었다.	→	①	②	③	④
29. 교수님의 피드백은 과목에 대한 흥미와 관심을 가지도록 이끌어주었다.	→	①	②	③	④
30. 교수님의 피드백은 수업과 관련된 분야에 대해 흥미를 가지게 하였다.	→	①	②	③	④
31. 교수님의 피드백 덕분에 이 수업이 더 중요하게 느껴졌다.	→	①	②	③	④
32. 교수님의 피드백 덕분에 수업에 더 적극적으로 참여하고 싶은 마음이 생겼다.	→	①	②	③	④
33. 교수님의 피드백으로 인해 수업활동/과제를 하는 게 즐거워졌다.	→	①	②	③	④
34. 교수님의 피드백을 통해 내 능력에 대해 긍정적으로 생각하게 되었다.	→	①	②	③	④
35. 교수님의 피드백으로 인해 다른 과목에서도 자신감이 생겼다.	→	①	②	③	④
36. 교수님의 피드백을 통해 과제/발표/시험에 대한 자신감이 높아졌다.	→	①	②	③	④
37. 교수님의 피드백을 받은 후 문제를 풀 때 자신감이 생겼다.	→	①	②	③	④
38. 교수님의 피드백을 통해 내가 문제를 잘 해결할 수 있을 것이라는 확신이 생겼다.	→	①	②	③	④

※ 긴 설문 하시느라 수고 많으셨습니다. 마지막으로 설문에 응답해 주신 것에 대해 소정의 보답을 드리고자 합니다. 귀하의 휴대폰 번호를 입력해 주세요. (010-****-**** 형식으로 입력해주세요).

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- 마지막으로 협조해주셔서 대단히 감사합니다 ♧ -

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Appendix E. Survey for the main test

대학수업을 위한 '효과적 피드백' 측정도구 개발 및 타당화

안녕하십니까?
본 연구에서는 학생들의 학업과 성장에 도움을 주는 효과적인 교수자의 피드백의 특성과 그 결과를 파악하여 '대학수업을 위한 효과적인 피드백 측정도구'를 개발하고자 합니다. 여러분의 답변은 대학교육의 개선을 위한 소중한 자료로 활용될 것입니다.

수집된 자료는 익명으로 분석에 사용되며, 연구 이외의 목적으로 사용하지 않을 것입니다. 본 설문에 대한 응답과 관련하여 옳고 그름이 없으며, 여러분이 느끼는 생각을 정확하게 표현해주시는 것이 가장 좋은 자료가 될 수 있으니 모든 문항에 솔직하게 답변해 주시기 바랍니다.

응답 시간은 약 15분에서 20분정도 소요될 예정이며, 조사 결과는 연구목적으로만 활용할 것을 약속드립니다.

설문지를 끝까지 응답해 주시고 성실히 답변해 주신 분들에게 모바일 상품권 5,000원권을 보내드리도록 하겠습니다. 설문을 완료하신 후 휴대폰 번호를 남겨주세요.

본 설문조사에 소중한 시간을 내주신 것에 대해 진심으로 감사드립니다.

조선대학교 일반대학원
교육심리전공
김규은

※ 본 조사와 관련하여 문의 사항이 있으시면 아래의 연락처로 연락 주십시오.

김규은
010-2995-0633
E-mail: gyueunkim84@gmail.com

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이제부터 설문을 시작하겠습니다. 의미 있는 연구가 될 수 있도록 여러분의 솔직하고 성실한 응답 부탁드립니다. :)

※ 귀하의 기본정보를 묻는 문항입니다.

2. 귀하의 성별은?

① 남자 ② 여자

3. 귀하의 학년은?

① 1학년 ② 2학년 ③ 3학년 ④ 4학년 ⑤ 5학년 이상

4. 귀하의 소속 학과를 적어주세요.

_____

5. 이 설문조사를 실시하고 있는 수업의 과목명을 적어주세요.

_____

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1. 다음은 설문을 실시하는 이 수업에서 교수님이 어떤 피드백을 제공해 주셨는지에 대해 묻는 문항입니다. 해당하는 번호에 ✓표시를 해주세요.

교수님은...		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
1. 학생의 과제나 활동, 발표에 대해서 잘한 점/부족한 점을 구체적으로 피드백 해주신다.	→	①	②	③	④
2. 학생의 과제나 활동, 발표에 대해서 어떤 부분이 적절하고 부적절한지 그 이유를 구체적으로 설명해 주신다.	→	①	②	③	④
3. 학생의 과제나 활동, 발표에 대해서 어떻게 수정해야 하는지에 대한 방향을 구체적으로 알려주신다.	→	①	②	③	④
4. 학생의 과제나 활동, 발표에 대해서 교수님께서 원하시는 과제의 형식과 틀에 부합한지에 대해서 구체적으로 알려주신다.	→	①	②	③	④
5. 학생이 활동/과제를 스스로 개선할 수 있도록 학생의 생각에 대해 더 자세히 설명해볼 것을 요청하신다.	→	①	②	③	④
6. 학생이 활동/과제를 스스로 개선할 수 있도록 문제 또는 학습내용에 대해 질문하신다.	→	①	②	③	④
7. 학생이 무엇이 맞고 틀렸는지를 스스로 찾을 수 있도록 힌트를 제공해 주신다.	→	①	②	③	④
8. 활동/과제를 수정하는 대략적인 방향을 제시해 주시면서 구체적인 방법은 학생이 스스로 고민하게 하신다.	→	①	②	③	④
9. 학생의 과제나 활동, 발표에 대해서 학생의 노력을 격려하기 위해 수행 및 발전과정에 대해 인정/칭찬해 주신다.	→	①	②	③	④
10. 학생의 과제나 활동, 발표에 대해서 학생을 응원하는 메시지를 전해주신다.	→	①	②	③	④
11. 학생의 과제나 활동, 발표에서 학생의 생각을 인정해주면서 사려깊은 어조로 피드백해주신다.	→	①	②	③	④
12. 학생의 과제나 활동, 발표에서 부족한 부분을 지적하면서도 학생의 장점도 함께 인정해 주신다.	→	①	②	③	④
13. 피드백을 제공하실 때 학생이 말하고자 하는 의미를 더욱 자세히 드러낼 수 있도록 다시 진술해 주시고 학생의 의견을 구하신다.	→	①	②	③	④
14. 피드백을 제공하실 때 학생이 의견을 충분히 말할 수 있도록 기회를 제공해 주신다.	→	①	②	③	④
15. 피드백 제공 후 학생의 피드백에 대한 이해정도를 확인하기 위해 질의응답의 기회를 제공해 주신다.	→	①	②	③	④
16. 피드백에 대한 학생의 생각을 확인하기 위해 논의할 기회를 주신다.	→	①	②	③	④
17. 피드백 코멘트가 적힌 과제물/시험지/답안지를 빠른 시일 내에 확인할 수 있게 하신다.	→	①	②	③	④
18. 학생이 학습내용에 대한 질문이 있거나 어려움이 있을 때 비교적 빠른 시일 내에 답변이나 조언을 해주신다.	→	①	②	③	④
19. 학생이 과제나 시험에 대한 피드백을 요청하면 빠른 시일 내에 피드백을 제공해 주신다.	→	①	②	③	④
20. 시험/퀴즈를 마친 뒤 빠른 시일 내에 수업에서 시험/퀴즈에 관해 피드백을 주신다.	→	①	②	③	④

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2. 위와 같이 교수님이 이 수업에서 어떤 피드백을 제공해 주셨는지에 대해 묻는 문항입니다. 해당하는 번호에 ✓표시를 해주세요.

A 교수님은...		전혀 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
1. 학생들이 자기들의 활동을 수정할 수 있도록 구체적인 피드백을 준비한다.	→	①	②	③	④	⑤
2. 학생들이 과제를 기대하는 수준으로 완성하는데 도움을 주기 위한 피드백을 준비한다.	→	①	②	③	④	⑤
3. 학생들에게 교사의 피드백에 반응할 기회를 준다.	→	①	②	③	④	⑤
4. 학생들의 수준에 적합한 피드백을 주고받는다.	→	①	②	③	④	⑤
5. 학생들이 공부한 문제를 읽고 해결방법은 스스로 찾도록 안내한다.	→	①	②	③	④	⑤
6. 문제해결방법을 학생들에게 직접 제시하기보다 단서(실마리)를 먼저 제시한다.	→	①	②	③	④	⑤
7. 학생들에게 칭찬하고 격려하는 긍정적인 피드백을 제공한다.	→	①	②	③	④	⑤
8. 학생들이 자신들의 활동에 쏟은 노력에 적극적으로 피드백한다.	→	①	②	③	④	⑤
9. 학생들의 학습동기와 자존감을 높이는 피드백을 제공한다.	→	①	②	③	④	⑤
10. 학생들의 질문을 경청하고 의견을 존중하는 편이다.	→	①	②	③	④	⑤

3. 다음은 설문을 실시하는 이 수업에서 교수님의 피드백이 여러분에게 어떤 도움이 되었는지를 묻는 질문입니다. 해당하는 번호에 ✓표시를 해주세요.

문항		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
1. 교수님의 피드백은 수업/학습의 목표를 파악하는 데에 도움이 되었다.	→	①	②	③	④
2. 교수님의 피드백을 통해 내 수행에 필요한 지식과 정보를 알게 되었다.	→	①	②	③	④
3. 교수님의 피드백을 통해 효율적인 학습/문제해결 방법(과제, 시험)을 터득하는 데 도움이 되었다.	→	①	②	③	④
4. 교수님의 피드백은 과제/수업활동/발표를 준비하는 데 도움이 되었다.	→	①	②	③	④
5. 교수님의 피드백을 통해 나 스스로를 더 객관적으로 바라보게 되었다.	→	①	②	③	④
6. 교수님의 피드백을 통해 나의 강점과 약점이 무엇인지 파악하게 되었다.	→	①	②	③	④
7. 교수님의 피드백을 통해 나의 수행에 대해서 다시 생각하게 되었다.	→	①	②	③	④
8. 교수님의 피드백을 통해 내가 무엇을 알고 모르는지 확인하게 되었다.	→	①	②	③	④
9. 교수님의 피드백을 받은 후에 필요한 자료나 과제 수행방법에 대해 교수님께 문의하게 되었다.	→	①	②	③	④
10. 교수님의 피드백이 이해가 안 되었을 경우에 교수님에게 물어보게 되었다.	→	①	②	③	④
11. 교수님의 피드백을 받은 후에 활동/과제 수행과정에서 교수님의 도움이 필요할 때 면담을 요청하게 되었다.	→	①	②	③	④

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문항	전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
12. 교수님의 피드백을 받은 후에 수업에서 더 많은 질문을 하게 되었다. →	①	②	③	④
13. 교수님의 피드백을 통해 내 능력에 대해 긍정적으로 생각하게 되었다. →	①	②	③	④
14. 교수님의 피드백으로 인해 수업활동/과제를 하는 게 즐거워졌다. →	①	②	③	④
15. 교수님의 피드백 덕분에 수업에 더 적극적으로 참여하고 싶은 마음이 생겼다. →	①	②	③	④
16. 교수님의 피드백으로 인해 다른 과목에서도 자신감이 생겼다. →	①	②	③	④

4. 이 수업에서 받은 피드백에 대한 여러분의 의견을 묻는 질문입니다. 해당하는 번호에 ✓표시를 해주세요.

B 나는 교수님의 피드백을 통해...	전혀 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
1. 수업에서 학습 목표가 무엇인지 파악할 수 있다. →	①	②	③	④	⑤
2. 내가 잘 몰랐던 부분이나 틀린 부분을 파악할 수 있다. →	①	②	③	④	⑤
3. 내가 더 노력해야 하는 부분을 파악할 수 있다. →	①	②	③	④	⑤
4. 내가 얼마나 잘하고 있는지 파악할 수 있다. →	①	②	③	④	⑤
5. 나는 피드백을 받으면 공부를 더 잘하게 될 것이라 느낀다. →	①	②	③	④	⑤
6. 나는 피드백을 통해 새로운 내용을 알아가는 것이 즐겁다. →	①	②	③	④	⑤
7. 나는 다른 사람들에게 학습에 대한 조언을 받는 것이 좋다. →	①	②	③	④	⑤
8. 피드백의 내용이 잘 이해가 가지 않으면 다른 사람에게 도움을 구한다. →	①	②	③	④	⑤
9. 나는 학습에 대한 도움이 필요하면 적극적으로 요청한다. →	①	②	③	④	⑤
10. 나는 잘 모르는 것이 생기면 다른 사람들에게 망설임 없이 도움을 구한다. →	①	②	③	④	⑤

5. 다음은 교수-학생 관계를 묻는 문항입니다. 해당하는 번호에 ✓표시를 해주세요.

C 문항	전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
1. 교수님은 학생들 편에서 학생들을 이해하려고 하신다. →	①	②	③	④
2. 교수님은 학생 한 명 한 명을 가치롭고 귀한 존재라고 생각하시는 것 같다. →	①	②	③	④
3. 교수님은 학생들을 공평하고 공정하게 대하신다. →	①	②	③	④
4. 교수님은 학생들의 상황을 세세하게 이해하려고 노력하신다. →	①	②	③	④
5. 교수님은 학생들의 이름을 외우려고 노력하시고 자주 이름을 불러주신다. →	①	②	③	④

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C 문항		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
6. 교수님은 학생들 한 사람 한 사람을 챙기시려고 노력하신다.	→	①	②	③	④
7. 교수님은 학생들에 대한 것을 기억하시고 말을 걸어주신다.	→	①	②	③	④
8. 교수님은 학생들을 전체로 대하는 것에 그치지 않고 학생 한 명 한 명에 대해 알고자 하신다.	→	①	②	③	④
9. 교수님은 수업에서 학생들과 대화하고 의견을 주고받는 것을 즐기신다.	→	①	②	③	④
10. 교수님은 학생들이 진솔하고 편안하게 자신을 표현할 수 있도록 수업분위기를 조성하신다.	→	①	②	③	④
11. 교수님은 학생들의 의견을 자주 물어보시면서 학생들의 이야기를 끌어내신다.	→	①	②	③	④
12. 교수님은 모든 학생들이 자신의 의견을 말할 기회를 주신다.	→	①	②	③	④
13. 나는 교수님을 가르치는 사람으로서 신뢰한다.	→	①	②	③	④
14. 나는 교수님이 계획하신 수업내용이나 수업활동이 나의 성장에 도움이 될 것이라고 믿는다.	→	①	②	③	④
15. 나는 교수님이 이 과목을 가르치시기에 합당한 지식과 역량을 가지고 있다고 생각한다.	→	①	②	③	④
16. 교수님이 생각하시는 것, 행동하시는 모습 속에는 배울 점이 많다.	→	①	②	③	④
17. 교수님은 학생들 모두 충분한 능력을 가지고 있다고 믿으시는 것 같다.	→	①	②	③	④
18. 교수님의 말씀과 행동 속에서 학생에 대한 긍정적인 기대를 느낄 수 있다.	→	①	②	③	④
19. 교수님은 학생들이 스스로에 대해 자부심을 가지도록 해 주신다.	→	①	②	③	④
20. 교수님은 학생들이 노력을 기울이면 수업과제를 잘 해낼 수 있다고 믿으신다.	→	①	②	③	④
21. 교수님의 태도에서 가르침에 대한 열정이 느껴진다.	→	①	②	③	④
22. 교수님의 수업을 들으면 수업준비를 위해 많은 노력을 하신다는 것이 느껴진다.	→	①	②	③	④
23. 교수님은 수업시간을 헛되게 보내지 않으신다.	→	①	②	③	④
24. 교수님의 모습에서 자신이 가르치는 분야를 좋아하고 소중하게 여긴다는 것이 느껴진다.	→	①	②	③	④
25. 나는 교수님의 수업에서 최선을 다하고 싶고 노력하게 된다.	→	①	②	③	④
26. 나는 교수님의 수업 때문에 관련 분야에 관심을 가지게 되었다.	→	①	②	③	④
27. 나는 교수님의 수업에서는 집중하려고 노력한다.	→	①	②	③	④
28. 교수님의 말씀을 들으면 나에 대한 자신감이 생긴다.	→	①	②	③	④

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6. 이 수업에서 여러분이 가진 학습태도에 해당되는 것에 ✓표시를 해주세요. (학업적 자기효능감)

D 문항		전 혀 그렇지 않 다	상당히 그렇지 않 다	그렇지 않은 편이다	그 런 편이다	상당히 그런 편이다	매 우 그렇다
1. 나는 수업 시간에 새로 배운 것들을 이미 알고 있는 것과 쉽게 연결시킬 수 있다.	→	①	②	③	④	⑤	⑥
2. 나는 보통 공부를 시작하기 전에 계획을 세우고, 거기에 맞추어 공부한다.	→	①	②	③	④	⑤	⑥
3. 나는 수업시간 중에 중요한 내용을 잘 기록할 수 있다.	→	①	②	③	④	⑤	⑥
4. 내가 싫어하는 수업시간에도 주의집중을 잘 할 수 있다.	→	①	②	③	④	⑤	⑥
5. 나는 복잡하고 어려운 내용을 기억하기 쉽게 바꿀 수 있다.	→	①	②	③	④	⑤	⑥
6. 나는 수업시간에 배운 내용을 잘 기억할 수 있다.	→	①	②	③	④	⑤	⑥
7. 나는 어떻게 공부하는 것이 효과적인 방법인지를 잘 안다.	→	①	②	③	④	⑤	⑥
8. 나는 정해진 시간 안에 주어진 과제를 잘 마칠 수 있다.	→	①	②	③	④	⑤	⑥
9. 나는 수업시간에 배운 내용 중 내가 무엇을 알고, 무엇을 모르는지 정확히 판단할 수 있다.	→	①	②	③	④	⑤	⑥
10. 나는 수업시간에 배운 내용 중 중요한 것이 무엇인지를 잘 파악할 수 있다.	→	①	②	③	④	⑤	⑥

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7. 이 수업에서 여러분이 가진 학습태도에 해당되는 것에 ✓표시를 해주세요. (목표지향성)

E 문항		전혀 그렇지 않다	그렇지 않다	그렇다	매우 그렇다
1. 나는 이 수업에서 가능한 한 많은 내용을 배우고 싶다.	→	①	②	③	④
2. 나에게는 이 수업의 내용을 가능한 한 완전히 이해하는 것이 중요하다.	→	①	②	③	④
3. 나는 이 수업에서 다루는 내용을 완벽하게 소화하고 싶다.	→	①	②	③	④
4. 나는 이 수업에서 내가 배울 수 있는 만큼 다 배우지 못할까봐 걱정한다.	→	①	②	③	④
5. 나는 때때로 내가 원하는 만큼 충분하게 이 수업의 내용을 이해하지 못할까봐 두렵다.	→	①	②	③	④
6. 나는 종종 이 수업에서 배울 수 있는 모든 것을 다 배우지 못할까봐 두렵다.	→	①	②	③	④
7. 나는 이 수업의 다른 학생들보다 공부를 더 잘하고 싶다.	→	①	②	③	④
8. 이 수업에서 나의 목표는 다른 학생들보다 좋은 성적을 얻는 것이다.	→	①	②	③	④
9. 나에게는 이 수업에서 다른 학생들보다 잘하는 것이 중요하다.	→	①	②	③	④
10. 나는 종종 이 수업에서 내가 다른 학생들보다 못할 수 있다는 두려움 때문에 공부한다.	→	①	②	③	④
11. 나는 이 수업에서 다른 학생들보다 못하는 것을 피하려고 공부한다.	→	①	②	③	④
12. 나는 이 수업에서 다른 사람보다 못하는 것만큼은 피하고 싶다.	→	①	②	③	④
13. 나는 이 수업에서 공부를 가능한 한 열심히 하려고 한다.	→	①	②	③	④
14. 나는 이 수업의 내용이 어렵더라도 계속해서 공부한다.	→	①	②	③	④
15. 나는 이 수업에서 다루는 내용을 배우기 위하여 최선을 다한다.	→	①	②	③	④
16. 나는 이 수업 공부에 최대한의 노력을 기울인다.	→	①	②	③	④

※ 긴 설문 하시느라 수고 많으셨습니다. 마지막으로 설문에 응답해 주신 것에 대해 소정의 보답을 드리고자 합니다. 귀하의 휴대폰 번호를 입력해 주세요. (010-****-**** 형식으로 입력해주세요).

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- 마지막으로 협조해주셔서 대단히 감사합니다 ♧ -