

Using Collaborative Pictures to Understand Student Experience

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Abstract—Summative feedback forms are used in academia for gathering data on course quality and student understanding. Students answer a series of questions based on the course they are soon to finish in these forms. Feedback forms are notorious for being homogenised and limiting and thus the data captured is often neutral and lacking in tacit emotional responses. This paper contrasts student feedback forms with collaborative drawing. We analyse 19 pictures drawn by international students on a pre-session course. Through visuals we present an approach to enable a holistic level of student understanding. Visuals communicate irrespective of possible language, cultural and educational barriers. This paper sought to discover if the pictures mirrored the feedback given on a typical feedback form. Findings indicate a considerable difference in the two approaches and thus we highlight the value of collaborative drawing as a complimentary resource to aid the understanding of student experience.

Keywords—Feedback forms, visualisation, student experience, collaborative drawing.

I. INTRODUCTION

STUDENT feedback has been widely criticised as an inaccurate evaluation of teaching effectiveness [1]-[4]. However, student feedback continues to be elicited at the end of many courses to attempt to find out any issues which could be addressed in order to improve the student understanding and experience for the next cohort. A variety of different methods are used for eliciting student evaluation but very few have become as popular as the feedback form (FF). Computing technology has indeed advanced the process, speed and overall aesthetics of the FF. The electronic form can be intuitive, user centred and intelligent in response prediction and result analysis. As such many universities, often for security reasons, purchase specific web-based survey engines as their approved electronic university survey tool. The electronic FF has the advantage of fast and accurate response rates but many universities still prefer to use paper based forms. Student feedback is of utmost importance in higher education. Student satisfaction results have a large impact on teacher grading and university ranking although some question the validity of opinion surveys suggesting they do not accurately measure teaching effectiveness [5]. Student feedback carries enormous weight but collection and dissemination methods are divided across universities. Thus, it would seem that the way in which universities collect student opinion data needs to be accurate, open, relevant and above all multifaceted. We suggest that feedback can be gathered in a

variety of ways to truly understand genuine attitude and accurate opinion. FFs are well known for their leading questions, strange Likert scales and often unfathomable pedagogical questions that allow for limited response. We suggest collecting data utilising one method of investigation gives limited and often one sided results. Therefore, we introduce the rich picture (RP) as a new way of gathering feedback information by the use of collaborative picturing. The RP is a popular tool used in computing science for complex information system design but has never been used in education as a student feedback tool. In this paper we will consider the benefits and drawbacks of using the RP for student feedback and contrast RPs with written FFs from international students. Fig. 1 is a copy of one of the 19 RPs that are used in this research.

The student group we investigate consists of international students required to complete a pre-session course of academic English in order to achieve appropriate language and study skills proficiency for degree level study. Depending on the student's initial level of English, the course may take up to three months to complete, with successful completion permitting students to continue onto undergraduate or postgraduate study at universities in Scotland.

II. LITERATURE REVIEW

This literature review has been divided into two sections as per the different approaches to gathering data on student understanding and expectation; RP, and FFs.

A. Rich Picture

The RP is a familiar tool used in computing to gather understanding about human activity for system design. The RP assists the exploration of different world views within a complex situation. The RP is a physical picture drawn by a variety of hands which encourages discussion and debate for groups and allows them to arrive at an agreed understanding. This makes it a powerful device in participatory processes. RPs consist of a set of entities we call icons. Icons can represent objects or processes such as action or emotion. The RP is not rule bound in facilitation, form or content and creators are encouraged to add their own subjective interpretation to the picture. The RP expresses, via a symbolic language, and aids group understanding by initiating problem investigation in a permissive environment. RPs have the capability to recreate in the present what has happened in the past, represent the now whilst offering insight into the future. RPs have, to date, been seen as an enquiry tool in system design. There has been dwindling research in the last 15 years

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on RPs and their uses within and out with the systems field with the notable exceptions of [6]-[10] and most recently Bell and Morse [11]. Some propose [9], [12]-[16] that a common key of icons or symbols might enhance the tool whereas others are strongly opposed to such structure. Although these authors

discuss the possibility of structuring RP icons they offer no empirical research into what the icons should be. There has been some recent research into RP icon understanding [17]-[19].



Fig. 1 Rich picture drawn by international students

The RP is never complete in itself and cannot ever be an empirical knowledge elicitation device but it can add extra dimension and a level of truthful tacit understanding. The collaboratively drawn RP offers a group consensus rather than an individual opinion. We argue the knowledge value of the RP and suggest the pictures can add a new dimension to feedback appreciation that can unify or compliment the standard student FF. As previously noted, this is the first time research has been undertaken looking at the RP as a feedback tool.

B. Feedback Form

Student feedback often involves a quantitative satisfaction survey which attempts to measure students' views on generic pedagogical, curriculum, and assessment aspects of a course [20] and can be given either during a programme of study or at the end. A general methodology for developing FFs is described by Harvey et al [21] based on their use at a university in England. Significant aspects of student experience may be gathered from focus groups then incorporated into a questionnaire survey in which are larger samples of students are asked to rate their satisfaction. Finally, responses from the survey are used to identify aspects of the student experience that are associated with high levels of

importance but low levels of satisfaction. Descriptive data from the surveys have been reported in institutional reports but little formal evidence exists on the reliability or validity of such data has been considered Harvey et al [22].

Using a formal instrument such as a questionnaire may enable the collection of feedback from an entire cohort of students and document their experiences in a relatively systematic way. However, this feedback is often collected in a class situation and little consideration is given to the ethical issues as to whether students should be required to contribute feedback in this way as they may feel under pressure to participate in the process [23].

FFs generally focus on the students' perceptions of the quality of the teaching they receive or their global perceptions of the academic quality of their programmes. However, research suggests that student satisfaction is a complex idea that is influenced by a wide variety of contextual factors that are not always intrinsically related to the quality of teaching [24]. Feedback is usually collected at the end of a course although obviously this would not benefit the respondents themselves [25] and often students' perceptions in the middle of a course may strongly influence their studying and final grades [26].

It could be assumed that student feedback would feed into curriculum design, help teachers to enhance their own professional skills and help institutions to manage their resources more effectively. According to Richardson [27] none of these assumptions have been confirmed by empirical research. Richardson [27] suggests one reason for the lack of attention to student feedback is the under-researched issue of the ownership of feedback data. Teachers may not want to act on the findings of feedback, and students may not see the value of providing feedback.

III. METHODOLOGY

This research involves data from feedback collected from a group of 260+ international under and post graduate students who studied on a pre-sessional English course in a Scottish University. Both university and students have been anonymised as some images portrayed in the RPs may be considered a negative reflection of the students' experience on the pre-sessional course whereas the purpose of the study is to demonstrate the value and the extra dimension that an analysis of RPs can provide to any given situation.

We investigate feedback in two ways. Firstly, we examine the information retrieved from FFs which are analysed in a quantitative way by comparing answers on Likert scales and qualitatively through open narrative text boxes. This has been achieved by clustering the form questions into 7 categories (Table I) and averaging the Likert responses in each category. These FFs were distributed and completed in class by 224 students. Secondly we investigate 19 RPs drawn collaboratively by groups of 4 to 6 students. These groups were spread across 14 classrooms with approximately 16 students per class. We are uncertain of exact numbers within each group because we did not personally facilitate every RP but instead a variety of teachers on the English course ran the RP sessions. The teachers encouraged the students to draw RPs in class, after listening to a lecture on 'Visual Aids and Doodling' and before completing their end of course tests. The theme for the RPs was loosely based on 'Pre-sessional course experience and life as a new student in the UK'. The theme was deliberately wide in scope to allow maximum participation and freedom of expression.

The RPs have been analysed using the Berg RP framework [19] and categorised into 4 core themes. These themes are then studied together with the FF results to discover to what extent the RPs can extend and add to the value of a summative FF. The framework is a sizable tool for RP analysis and cannot, taking into account the scope of this paper, be used in its entirety for a full investigation. The framework, for example, investigates areas such as RP facilitation which, for this study, is information that was unavailable due the different teachers overseeing the drawing of the RPs. Therefore, small subsets of core themes have been adopted from the framework which will be used to analyse the RPs in this study. This is an acceptable way to proceed RP analysis as per the framework guidelines. The core themes are:

- **Icons,**
- **Cultural difference,**

- **Emotion,**
- **Atmosphere.**

As previously stated, all students were anonymised and therefore there is no way of knowing if the students who completed FFs and who engaged in RP drawing were one and the same. FF participation was mandatory and RP participation was promoted but not enforced as part of a classroom activity but only for a small selection of teaching classes. Not all teachers engaged in the RP classroom activity. As stated it is not possible to know the group size of each RP drawing but it is expected that minimum of 4 and maximum of 6 students drew the group RPs. This would suggest that between 76 and 114 students completed a collaborative RP drawing.

FF interest was in student perceptions of various aspects of the course that primarily were answered on a 1-6 Likert scale or within a small text box. A paper version of the form was handed to students to complete during class time and the students were given as much time as they needed to fill in the questionnaire before the end of the class. Some teachers facilitate the anonymity of this process by leaving the class while the students complete the FF and asking students to put the form in a brown envelope for collection. However, the teachers were given no clear instructions on how to deliver the FF and were informed it had to be completed and returned to the course director by a certain deadline. The FFs were handed out at the end of the pre-sessional course, after the students had completed their exams.

This paper sought to find what, if any, use the RP drawings have to aid understanding of student experience when used alongside a typical FF. Therefore, we concentrate the majority of analysis on RP interpretation and possible meanings. Finally, due to picture restrictions in this publication it is only possible to include a few representations of drawings and thus not all discussed icons will relate to viewable pictures.

TABLE I
 SEVEN THEMED CATEGORIES OF QUESTIONS SHOWING LIKERT SCALE
 AVERAGE RATING (SCALE OF 1 TO 6 WITH 6 BEING THE HIGHEST OR MOST
 SATISFACTORY)

Themed categories in the FF	Average Rating
1. Welcome to course including pre-arrival information	5.5
2. Course materials	5.35
3. Assessment	4.6
4. Use of VLE and Turnitin	5.35
5. Social Programme	5.0
6. Support	5.1
7. Recommended	5.0
Overall average rating across all questions	5.13

IV. FINDINGS FROM THE SUMMATIVE FEEDBACK FORM

224 perceptions of the programme were provided through a feedback questionnaire in which students were asked to rate various aspects of the programme on a scale of 1 to 6 with 6 being the highest or most satisfactory. Overall, the Likert scale ratings show very positive student feedback on all aspects of the programme. Students were least satisfied with the methods of assessment on the course (an average of 4.6) and most

satisfied with the information they were given before arriving in the UK at the beginning of the course (an average of 5.5).

V. RP FINDINGS / INTERPRETATION

A. Icons

The RPs were facilitated by different teachers on the course. The RPs were highly colourful as, prior to class, students were asked to bring in coloured pens. Research has shown that colour in a RP is an excellent enabler for correct interpretation [19]. Table II indicates the common repeating objects in the RPs confirming the amount of times across 19 group RPs the object has been drawn and whether the subject of the object is relevant to academia or not. The table also indicates whether the objects are drawn in a positive domain or whether the object, and/or neighbouring objects, reflect a negativity of domain.

TABLE II
REPEATING OBJECTS IN THE 19 RPs SHOWING IF DRAWINGS RELATED TO ACADEMIA AND ALSO IF THEY WERE DRAWN IN A POSITIVE OR NEGATIVE WAY

Repeating Objects	Repetitions	Academic/Non Academic	Positive, Negative or Neutral
Stick figures representing the members of the group	4/19	Non Academic	Neutral
Students playing a variety of different sports	5/19	Non Academic	Positive
Food and drink	11/19	Non Academic	Positive
Parks/ green space	11/19	Non Academic	Positive
Books and homework	12/19	Academic	Negative
Bed	10/19	Non Academic	Negative
Flags	5/19	Non Academic	Neutral
Animals/Birds	6/19	Non Academic	Positive
Hearts /Broken Hearts	6/19	Non Academic	Neutral
Students studying alone	5/19	Academic	Neutral
Group work in classroom	8/19	Academic	Neutral
Teachers	7/19	Academic	Neutral
Bus	6/19	Non Academic	Positive
Aeroplanes	4/19	Non Academic	Positive
Cigarettes	3/19	Non Academic	Negative
Famous Scottish landmarks	7/19	Non Academic	Positive
Weather	8/19	Non Academic	Neutral
Shops (showing brands)	5/19	Non Academic	Positive
Students crying	10/19	Non Academic	Negative
Students tearing at their hair	4/19	Non Academic	Negative
Communication issues between teacher and student	7/19	Academic	Negative

NB: many RPs are only readable for interpretation when they are rotated (Fig. 1). This is because they are constructed by many hands which have access to only certain parts on the paper from different angles. The interpretation of the following RPs is entirely qualitative and observational but has however been conducted by a specialist on RP interpretation. RP interpretation was the subject of a previous PhD thesis by one of the authors of this paper. It is apparent from this data that the most commonly drawn icons are 'food and drink', 'parks and green space' and 'books and homework'. Fig. 2 is

an example of the iconography drawn for parks and green space. Discovering new food was a familiar drawing and pictured as a large and important aspect of student study in a new country. Teachers with classrooms of students were often drawn in the RPs and although the teachers did not have any specific negative imagery there was a common theme of lack of communication (Figs. 3-5). Classrooms depicting groups of students working in small groups was a common icon which may have been a new concept for some of the students. The bed icon was also a familiar object across the RPs and students drew sleeping stick figures often worrying over workload whilst they slept (Fig. 6). There was a significant negative association with cigarettes with these icons being drawn with a cross through them. This is called as a litotes icon; drawing a negative to affirm a positive. The weather in Scotland was a commonly drawn. It should be noted that many of the students came from hot climates and the weather was obviously an issue worth drawing. The 4 seasons in one day seemed to be remarkable. The University bus icon was drawn by 6 groups in a positive image and thus illustrates the quality of the transport system to and from the University. Five groups drew positive images of high street shopping and even named their favourite shops. Many groups drew aeroplanes and flags. These images were often depicted in a rather sad way drawn in conjunction with other images, such as broken hearts, showing distance from family and home. Homesickness was apparent in many RPs.

B. Cultural Difference

As previously stated the students were new to Scotland and mostly came from Asia and the Emirates. Cultural differences were very apparent in the RPs. Fig. 2 was a common icon depicting freedom but, as already mentioned, it is unclear as to what the word freedom refers to. Food was a strong theme with students showing enjoyment of differing tastes but also many showing satisfaction with well-known brand foods, such as MacDonald's. The golden arches of the MacDonald logo reoccurred in 4 separate RPs. Two of the RPs depicted rather unpleasant smells that exist surrounding certain acts and places, i.e. eating chips in an enclosed space such as a bus. Interestingly Smell was a frequent image in the RPs with cigarettes being drawn as highly unpleasant. Cultural difference was further drawn by some when depicting stories such as 'swans are not for eating' and 'doors in university are secured by alarm systems'. It was a common occurrence for these particular students to set off alarms in the Scottish university.

The most common theme recorded across all the RPs was the issues of communication between teacher and student. Figs. 3-5 show this in a variety of ways. Fig. 3 is a powerful image from one RP showing tears of frustration from a teacher with student's clearly not understanding. Fig. 4 describes how accent of teachers is a problem whilst Fig. 5 depicts a scene wherein a teacher and student show signs of a total breakdown in communication. We will discuss the emotional aspect of Fig. 6 in the following section but it is worth noting that student sleeping and bed icons were common across 10 RPs.

Fig. 7 is probably the most worrying images from a pedagogic viewpoint as it shows students afraid to ask for help in class.



Fig. 2 Possible dichotomy in interpretation. Freedom reference to Braveheart the Movie or freedom as a result of being away from home /parents?



Fig. 5 Teacher/student communication issues

Open Science Index, Educational and Pedagogical Sciences Vol:10, No:4, 2016 publications.waset.org/10004247.pdf

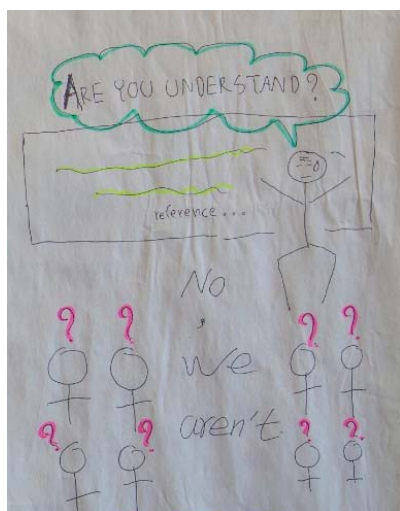


Fig. 3 Communication issues



Fig. 6 Student worries



Fig. 4 Accent issues in Scotland. The 'Ch' and 'E' refers to Chinese and Emirates students



Fig. 7 Classroom scene

C. Emotion

Emotion was shown through simple images of happy and unhappy faces. The pictorial visuals within the RP showed an apparent unhappiness across many RPs. Acute crying (drawn as waterfalls from eyes) was a common emotion in ten RPs (Figs. 8-10) but it was sometimes unclear as to whether this was from homesickness or work overload or general stress. Difficulty in sleeping specifically due to workload (Fig. 6) was clearly evident and many RPs showed images of students studying independently late into the night (Fig. 15). Icons of students tearing their hair out and showing other forms of

despair (Figs. 12 and 13) were common alongside broken heart icons. It was often unclear where the broken heart related within a particular story in the RP. There were clear indications that students felt overwhelmed on the English course and struggled to manage the course work whilst living independently away from home. However, the RPs were drawn 2 weeks before the end of coursework and exams and thus students were understandably nervous about their performance in such a high-stake examination. In order to secure a place at a Scottish university and continue to with their studies in the UK, it was essential to do well in the upcoming assessments

There were many images of happy scenes in RPs (Figs. 2 and 11) showing enjoyment of new experiences and pleasure within certain surroundings. There were also images that are expressed as a pathological icon [19] and were cause for concern. Fig. 12 shows a student curled up in a fetal position whilst Fig. 13 shows high levels of stress during independent study. Visual metaphor of emotion is common in the RPs. Participants are often abler to explain what they mean by using metaphor. Sometimes this can be comical. Fig. 14 is an example of visual metaphor; a student drowning in a pile of books.

Figs. 8-10 depict in a 'manga' style the pouring of tears from eyes.



Fig. 8 Manga style crying

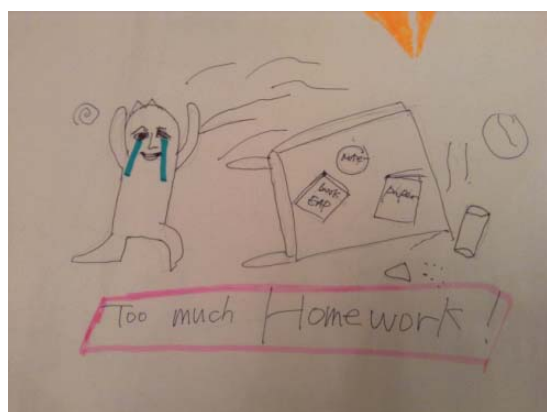


Fig. 9 Manga style crying



Fig. 10 Manga style crying



Fig. 11 Students enjoying the social and cultural programme



Fig. 12 Icon showing anxiety and despair

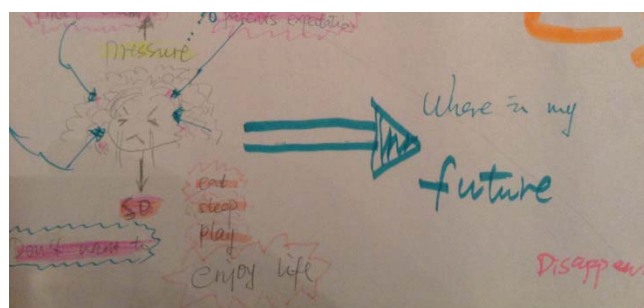


Fig. 13 Student pressures

A. Atmosphere

General mood was clear to judge in the RPs. There was a strong impression across many RPs of worry and frustration. Fig. 13 shows clear evidence apprehension resulting in anxiety on whether students would pass the course. It was drawn that students found the workload very difficult and struggled with homework assignments. As noted above, crying students (Figs. 8-10) depicted particularly strong emotion and thus the atmosphere in many RPs was often of despair and sadness. Individual study imagery showed students toiling under pressure (Figs. 9 and 15).

Pressures of new environment were apparent in some RPs but many students showed how much they were enjoying their new surroundings. Mood was usually very positive in drawings depicting shopping, food and sports. Overall the icons in the RPs ranged from crude sketching (Fig. 7) to quite artistic design (Fig. 14). Interpretation was clear however, with the addition of simple text bubbles.

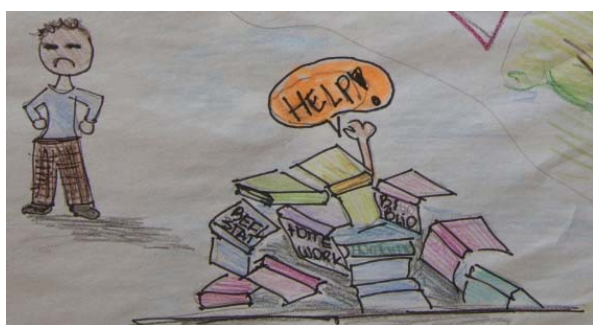


Fig. 14 Comical visual metaphor

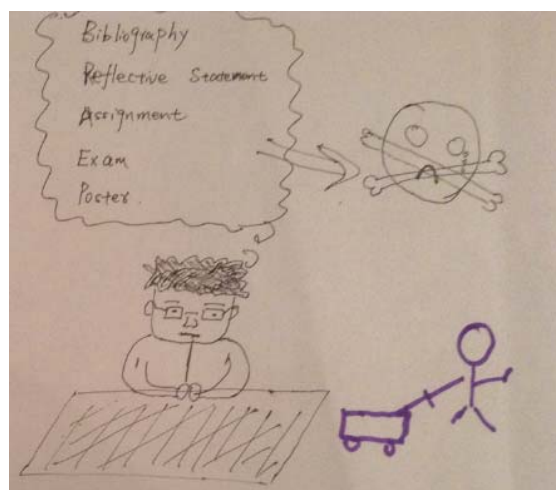


Fig. 15 Study concerns

VI. RESULTS

There were very few direct similarities to compare across the RPs and the FF responses. The feedback questions were specific and requiring a numerical Likert scale answer. The general feedback response on the forms was very positive with students giving high rated ranking scores for all questions with the average across all questions being 5.15/6. These feedback

questions were much centred on course content, materials used, software utilised and other areas such as exams, classroom support, homework and academic writing. The majority of questions therefore asked very explicit queries and thus, through Likert scales, provided a limited and restrictive means of response. Text boxes were sometimes given but very few students wrote in them. Those students that did write in the text boxes seemed to take a formal approach in giving comment and gave answers that were only course related; i.e., 'textbook is too expensive' or 'plagiarism software not stable'. The RPs tell a totally different story however. The RPs, as shown in Table II, tend to highlight and display emotion surrounding non-academic information more than the academic topics. The lack of a structured question seems to allow the students to display a wide variety of tacit response. The FF rated the social programme on the course as a 5.1/6 and this was also reflected positively in the RPs. The social programme included trips to Scottish places of interest and this was shown in the RPs (Fig. 11).

Assessment was rated by the students as a 4.6 which was the lowest rating received over all the FF answers. This was also reflected in the RPs but considerably greater in emotional visual response. Anxiety surrounding coursework and assessment was frequently referred to in many RPs. Communication difficulties were not referred to in the questions within the FF. However, because the RP allowed for freedom of expression on any student subject, communication issues were seen as abundant and unmistakable in visual interpretation. Our findings suggest that the restrictive and formal style of questions in a FF can produce straightforward and easy to measure responses through a Likert scale but often do not really inform or have significance on wider student experience. Research suggests that feedback questions are often leading questions. For example, in Theme 6 (Table I) students were asked questions on support. The questions focussed on teacher support in classrooms and the students ticked a box on a 6-point scale to determine how supported they felt. We suggest that the RP offers a far less restrictive platform for student comment. There were many visual metaphors suggesting a rather dismal atmosphere existed amongst the students surrounding study, communication and learning, particularly as these RPs were completed in the period before assessment whereas the FF were completed after the assessment and students had received their results. Despite their initial worries, over 98% of this student group passed the course and were able to proceed to their undergraduate and postgraduate programmes. It is fair to surmise that collaborative group drawing could possibly elicit a rather theatrical or exaggerated visual metaphor but our results show that certain icons, drawn in different classes and in different rooms, show clear repetition of these emotions.

The RP, used as a feedback tool, gives very general, qualitative and holistic information that communicates emotion and meaning through visual metaphor. In comparison the feedback form is formal, explicit and specific in query. The FF undeniably offers a way of quantifying results whereas the RP is open to interpretation and sometimes difficult to

appraise or assess. So, The RP has both benefits and drawbacks when used as a feedback tool. Finally, there does seem to be a dichotomy here, on one hand the FF elicits formal and non-emotional response whereas the RP elicits a highly passionate and sometimes emotive opinion. Therefore, those educators that wish to apply the combined approach of the RP and the FF should do so with acceptance that it might be disconcerting to see the possible negative images that can emerge from student groups in a picturing environment. Furthermore, the timing of when the activity of eliciting the RPs and the FFs is crucial as both provide a snapshot of student perceptions as the time the activity is completed.

VII. CONCLUSION

We acknowledge that the standard academic feedback form is a useful way to gather information on specific questions to assess the quality of programme but, if one would like a deeper and fuller picture of student feelings and emotions, then the RP has certain benefits. Depending on the questions the FF can be limiting and restrictive and often rather self-aggrandising however questions can be quantified, which is important. Educators can, utilising the FF results, purport a homogenised set of results to claim programme quality and student experience. The RP shows raw feeling, true opinion and offers an overall atmosphere of student mood. The RP is rarely sensitive to interpretation and thus certain icons and stories can be rather melodramatic in visual metaphor. We acknowledge the high levels of emotion displayed in the pictures and accept that this is likely when students are nearing coursework completion and exams. The RP, in effect, reflects student feeling at the moment of drawing and thus can change depending on circumstance and environment. There are however issues with RP interpretation and, except for a few authors [28], there has to date been a dearth of development in interpretations of the RP.

The RP can offer a novel multifaceted approach to gathering feedback. The RP offers a unique platform for holistic student understanding and thus, due to its rule less structure, allows for a variety of issues, both pleasurable and anxious, to be aired. In essence there is little similarity between the two approaches. However, our findings suggest, used together as complimentary tools, the RP and FF can offer significant opportunity for quality all-inclusive student understanding. Together they offer a unique way of gathering both qualitative and quantitative results and thus extend the true value and worth of summative feedback. Finally, The RP as a tool for gathering knowledge has impact concerning issues of student transition to new educational environments and, in particular, the emotions of this adjustment.

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