Operators matter – An assessment of the expectations, perceptions, and performance of dentists, postgraduate students, and dental prosthetist students using intraoral scanning

Short title – Assessment of different operators using intraoral scanning

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Abstract

Objective: to assess the expectations, perceptions and performance of different operators with varying backgrounds and training in the use of full-arch intraoral scanning (IOS). Methods and materials: Dentists (DENT), postgraduate dental students (DPG), and student prosthetists (PROS) were invited to join an IOS training workshop. Participants completed a satisfactory scan of a manikin-mounted typodont with the total scanning time (TST) recorded. They also completed anonymised pre and post-training questionnaires covering their background, and IOS expectations and experience. Statistical analysis was performed using the Mann-Whitney U, Kruskal Wallis, and chi-square tests. Open-ended questions were analysed manually and using Leximancer. Results: Twenty-seven participants were recruited: 10 DENT; 10 PROS; and 7 DPG. Positive expectations of IOS was reported by 93% of participants. Combined TST was 285 ± 83 secs, with the PROS TST significantly longer ($p < 0.05$, 337 ± 79 secs). Further training need was reported by 60% of PROS and 50% of DENT versus 14% of DPG. Positive IOS experience was reported by 96% of participants, 74% perceived it to be accurate, and 63% found it easy to use. Eighty-five percent of all participants stated that cost would influence their decision of adopting IOS in their practice. Conclusion: Expectations and perceptions of IOS were overwhelmingly positive, irrespective of operator background and experience. Scanning performance and training needs depended on the operator's background. Cost of IOS remains a barrier to acquiring the technology. Clinical significance: IOS

training must be customised to accommodate the needs of different operators. The cost of IOS needs revision to improve its accessibility

Keywords

Scanning; education; full arch; perception; performance; efficiency; prosthodontics

Introduction

The applicability of digital dentistry in the form of intraoral scanning (IOS) as part of routine dental care is playing an increasingly critical role. The acquisition of a digital image of the dentition or even partially dentate arches offers an alternative to conventional impression making (CI) that is preferred by patients, reportedly reducing the discomfort, anxiety and nausea associated with conventional impression making. [1] IOS also seems to be more efficient when compared to CI with reduced chair-side time, albeit the identified reduction is yet to be significant. [2] Moreover, IOS when combined with cone-beam computed tomography (CBCT) and extraoral face scans can provide dentists with a virtual dental patient image that has the potential of reducing chair-side and laboratory time, and consequently the overall cost of dental care. [3] Consequently, IOS can also be a valuable research tool where accurate and consecutive images of the dentition can be non-invasively acquired and compared over the length of a longitudinal clinical study or trial. [4] Nonetheless, as part of any educational program on IOS, it is essential to highlight the limitations of the technology equally. Compared to laboratory scanners and conventional impressions, IOS demonstrates more limited and highly variable accuracy depending on the scanning system and protocol [5], ranging between 17 – 378µm for a dentate full-arch and 44 – 591µm for an edentulous one. [6] Furthermore, the long-term clinical performance and comparative effectiveness of restorations fabricated using the digital versus a conventional workflow is lacking. [7, 8] Similarly, the cost-efficiency of introducing the technology in routine dental practice is dependent on its intended applications. [9-11] Accordingly, understanding the expectations and perceptions, and the individual educational needs of various beginner operators when introduced to this technology are fundamental to ensure increased access and uptake of IOS by the dental team. This understanding is especially pertinent given the fact that the eventual replacement of CI will entail uptake of the technology by all relevant members of the oral health practitioner team, which includes Dental Prosthetists, known as Clinical Dental Technologists or Denturists in other countries, Dental Hygienists, Dental Therapists, Oral Health Therapists, and Dental Surgery Assistants.

Several studies have investigated the experience of educating and training operators in the use of IOS. In undergraduate education, students either preferred IOS to CI when they had no or limited experience in CI [12, 13] or reported no preference between both techniques when they were experienced in CI. [14] Experienced dentists also reported no preference, found CI to be more efficient than IOS, and reported comparable difficulty levels between techniques. [15] The instruction time for IOS was also reported to be significantly greater than that for CI for undergraduate students. [16] Postgraduate dental students also demonstrated an associated learning curve with IOS, improving performance with repetitive scanning. [17] On the other hand, there are very few studies investigating the perception and performance of other members of the dental team in using IOS, none of which to the authors' knowledge involving Dental Prosthetists. Two studies have investigated the use of IOS with Dental Hygienists. [18, 19] These studies demonstrated that clinical experience and the type of scanning system resulted in varying performance amongst Dental Hygienists with perceptions of the technology and its difficulties in use improved with further training.

The aim of this study was to compare the expectations, perceptions, and performance of various oral healthcare professionals with different levels of experience. Dentists, postgraduate dental students, and dental prosthetist students were surveyed on the use of IOS for full-arch scanning using a questionnaire and their complete-arch scanning time. The null hypothesis was that there would be no difference between the different operator cohorts.

Materials and methods

The study was conducted as part of a training workshop aimed at providing practical IOS training in a simulated clinical setting to different operator cohorts. The three identified cohorts were dentists (DENT), dental postgraduate students (DPG), and final-year dental prosthetist students (PROS). Potential participants were invited to join the training workshop through email based on their availability on the proposed training workshop dates. Ethical approval to conduct this project (reference number 2019/477) was granted via the University's Human Research Ethics Committee. Full-time and visiting clinical supervisors, who were present on the scheduled training dates; postgraduate dental students; and final-year dental prosthetist students were invited to participate. A modified questionnaire based on a previous study by the authors was given to the participants pre- and post-training [14].

Calibration of assessors

The assessors (KP, JE, AQ, MP) were trained by an experienced operator (KA) who acted as the gold standard and trainer. Each assessor proceeded to complete an IOS scan under the supervision of the trainer, until deemed satisfactory by both the assessors and the trainer, KA. An IOS was considered satisfactory if the scan captured all essential data of occlusal, buccal, and palatal surfaces, and interproximal areas, as would be expected from a conventional elastomeric impression.

Intraoral scanner details

The Primescan™ intraoral scanner (Dentsply-Sirona, Bensheim, Germany) is a powder-free, trolley-based, colour scanner that is an upgrade of its predecessor, the Omnicam scanner. The Primescan™ relies on dynamic depth scanning technology through a sensor capable of processing more than one million data points per second using white light at a scanning depth of 20 mm. The scanner relies on triangulation with a video-sequencing technique for data-capturing. The full-arch trueness of the scanner has been reported to be $32\pm10\mu\text{m}$. [20] The software used was the Cerec software v. 5.0.0 (Dentsply Sirona).

Pre-training questionnaire - expectations

Participants were initially provided with an information sheet covering the aim and details of the study, its protocol, and the anonymised data to be collected. They were then assigned a unique identification number and asked to complete a pre-training questionnaire. The questionnaire covered information pertaining to the participant's educational and clinical background, previous hands-on experience using intraoral scanning and their perceived expectations of the technology.

Full-arch scan training and performance-recording

To ensure standardisation of training, all participants were trained by the same trainer, KA. The training workshop involved an introduction to intraoral scanning, mode of operation of the intraoral scanner, followed by a hands-on demonstration of a full-arch IOS. Thereafter, each participant familiarised themselves with the scanning equipment and attempted an initial scan of the mannikin head-mounted model (model 200, NISSIN, Nakagyo-ku, Kyoto, Japan) using the intraoral scanner. Once ready, each participant then completed a full-arch IOS under the supervision of one of the calibrated assessors (KP, MP, JE, or AQ) and the trainer (KA). The standardised scanning protocol involved scanning the occlusal surface of the upper right or left second molar, followed by the palatal, and finally, the buccal surface of the upper dental arch. The scan was assessed for areas with missing data and those areas were rescanned, and later reassessed accordingly as a new scanning attempt. The IOS performance of each participant was assessed as a function of the time required to complete a single, full-arch IOS, that was deemed satisfactory by both the assessor and the trainer, and was recorded as the total scanning time (TST). The number of attempts necessary to achieve a satisfactory full arch scan without any missing essential data was also recorded.

Post-training questionnaire - perceptions

Once each participant completed a satisfactory full-arch IOS, they were then asked to complete a post-training questionnaire which consisted of seven questions using 5-point Likert scale responses and one open-ended question. The questionnaire included the participant's perception of the overall IOS experience, its perceived degree of difficulty, further training needs, time-saving attributes compared to conventional impression making, willingness to adopt the technology and the influence of cost on such a decision. The participants were also asked to identify three main advantages and disadvantages of IOS.

Statistical analysis

The analyses were performed using Stata version 14.0 (StataCorp, College Station). Participants' characteristics during the pre- and post-training were described, including absolute and relative frequencies of their responses to the questions. Non-parametric Mann-Whitney U-test and Kruskal Wallis test were employed to examine differences between response frequencies to different questions, respectively. The chi-square test was used to compare proportions of categorical variables.

Open-ended questions were analysed manually using an Excel spreadsheet and colour coding to identify key response themes. This was followed by Leximancer data analysis. Leximancer is a software

program that transforms natural language into semantic patterns through lexical co-occurrence.[21]

A thesaurus of words related to the concepts is displayed visually to show associations and connections. The map provides visual representation of themes in relation to the participants. Themes are shown by the coloured circles, and the lines between indicate the semantic link.

Results

In total, twenty-seven trainees attended the five hands-on training sessions organised in the university's dental clinic, all of whom agreed to participate in the study. Study participants included ten dentists, seven dental postgraduate students, and ten dental prosthetist students.

Description of the participants' characteristics is displayed in Table 1. One-third of the participants (33.3%) completed their primary degree two or fewer years prior. This proportion was higher among Prosthetist students who had completed a Bachelor of Dental Technology before the clinical program (Bachelor of Dental Prosthetics) (90.0%). Most dentists (70.0%) and slightly more than half of the Postgraduate students (57.1%), respectively, graduated 15 or more years ago and between 6 to 10 years ago. Australia and New Zealand were the countries where most Prosthetist students (90.0%) and Postgraduate students (85.7%) obtained their degrees. Overall, none or minimal previous experience with the use of intraoral scanners was reported by the participants, while very few dentists (20.0%) and Postgraduate students (14.3%) reported moderate prior experience. Very positive and somewhat positive expectations were stated from most of the participants with no significant difference among groups observed ($p>0.05$).

Table 2 shows the participants' post-training responses. There were no significant differences among the three cohorts for any of the variables assessing the operator's perception of IOS post-training. The overall perception of IOS was either somewhat positive or very positive (96%) and either easy or very easy to use (63%). With regards to further training needs, 60% of the Prosthetist students and 50% of the Dentists reported a need for further moderate or extensive training in IOS, in contrast to only 14% of the Postgraduate students. Overall, the perception of intraoral scanning time varied between neutral (48%), timesaving (30%), and time-consuming (22%).

Figure 1 shows the total time spent scanning per group. The overall average time was 285.07 seconds and varied significantly between the Prosthetist students group (336.50 seconds) X Dentists group (264.90 seconds) and the Prosthetist students group X Postgraduate students group (240.43 seconds). (Figure 1).

No significant differences were observed with regard to the average time spent during scanning amongst the groups, and the degree of expectation pre and post-training.

Among those who required no or minimal training, 80% considered the scanning process an easy task, in contrast to 40% and 50% among those who required moderate and intensive training, respectively. However, the differences were not significant when two by two comparison groups were performed. Moreover, no significant association was found between the cost and the intention to adopt the intraoral scanner (Table 4).

Performance

The mean TST for a full-arch scan for all cohorts combined was 285 ± 83 secs (4mins 45sec $\pm$ 1min 12secs). The PROS cohort needed significantly ($p < 0.05$) longer time to complete a satisfactory scan (337 ± 79 secs), followed by the DENT and the DPG cohorts at 265 ± 57 secs and 240 ± 91 sec, respectively.

Overall 89% ($n = 24/27$) provided responses to the open-ended questions. The questions elicited 68 comments on advantages and 68 comments on the disadvantages of IOS (Appendix 2).

The themes of the reported advantages were focused on the time-saving attributes of IOS ($n=16$, 59%) and the perceived improvement in patient comfort ($n=11$, 41%). Other comments highlighted the streamlined digital workflow to the laboratory ($n=7$, 30%) and improved accuracy ($n=6$, 22%).

Participant cohorts did, however, vary based on their perception of the advantages (Fig. 2). Whilst the majority of DENT identified patient comfort as the main advantage of the technology, dental postgraduate students perceived the digital workflow as the dominating advantage. An even number of PROS and DENT thought that saving time was advantageous. A dentist went further to suggest that intraoral scanning would result in less environmental waste.

The responses describing the disadvantages of IOS were mainly themed around cost ($n=15$, 55%), and possible issues with accuracy ($n=13$, 48%) (Fig. 3). Technical complications or appropriate scan acquisition issues were also reported ($n= 7$, 26%). All groups recorded concerns with the level of accuracy, in particular, DPG and DENT thought IOS impedes capturing subgingival margins and the prosthetist students thought there would be difficulties with recording hyperplastic soft tissues. The overall cost of acquiring an intraoral scanner was a predominant disadvantage for both prosthetists and dentists. The PROS comments were mostly focused on the technical issues and the bulky nature of the scanner head. On the other hand, dentists echoed sentiments expressed in the questionnaire around further training needs.

Discussion

The overall expectations and perceptions of the use of IOS were overwhelmingly positive. However, the performance, perceived training needs and advantages were influenced by the operator cohort. The findings of this study did indeed identify improved IOS performance with reduced scanning time required to complete a full-arch scan versus making a conventional impression. The average setting time for an elastomeric impression, from the start of mixing, normally exceeds five minutes, not counting the time needed to intraorally assess the tray fit and adjust it accordingly, adhesive application, and loading, seating and setting time.[22] In this study, the average time required to complete a full-arch IOS was 4 minutes 45 seconds, which does support the perceived time-saving advantage reported in the questionnaire by the participants. The average IOS time in this study was almost identical to that of a similar study involving a single cohort of forty-nine undergraduate dental students using three different intraoral scanners to acquire a comparable full-arch IOS. [14] That study identified that the type of scanning system had a significant influence on the scanning performance. Nonetheless, it is necessary to highlight that the IOS time recorded in this study did not include the time needed for initiating the scanning system, calibration of the system, moisture control and retraction of soft tissues, if necessary, or data processing.

Interestingly, the TST using the Omnicam scanner identified in a similar study was 4 mins 42 secs ± 51 secs [14] which was almost identical to the TST acquired in the current study of 4 mins 45 secs ± 83 secs when all groups data were pooled. On the other hand, the TST was considerably longer than the 4mins 15secs ± 72 secs scanning time when only the dentists and postgraduate students' groups were assessed. These findings indicate that the operator's training and background do have a significant impact on the performance of intraoral scanning in terms of efficiency. On the other hand, both the more-experienced Dentists and the less-experienced Dental Prosthetist student cohorts reported the need for further moderate training on using IOS, when compared to the Postgraduate student cohort. These findings are especially pertinent since, to the authors' knowledge, this is the first study to assess the expectations, perceptions, and performance by Dental Prosthetist students in using intraoral scanning. A possible explanation is that the clinicians, whilst they were more clinically experienced with 70% having more than 15 years experience, yet, remained less confident in the technology compared to conventional impression making as a reference [15], which was reflected in this study in their desire for further training. In contrast, dental prosthetist students were less clinically experienced with 90% of them having less than 2 years of experience, and hence requiring further training. Nevertheless, these training needs did not affect the overwhelmingly positive experience of IOS reported and it is reasonable to expect a learning curve involved with using the technology. A

recent study investigated the learning rate and changes in difficulty perception amongst twenty Prosthodontics resident students with repetitive scanning using the Omnicam scanner.[17] That study concluded that there is a need for five IOS scanning attempts for users to achieve a competence of 80% of their best attempt over a period of three days of training. The study also identified a significant reduction in maxillary arch scanning time, from 2mins 36secs $\pm$ 51secs to 1min 16secs $\pm$ 22, and perceived difficulty from a score of 6 to 4 as a result of repetitive use. This learning curve is further confirmed by another study involving twenty-nine Dental Hygienists identifying a significant improvement in full-mouth IOS time after ten attempts, from 14mins $\pm$ 287 to 10mins 57secs $\pm$ 170.[18] The study also identified that more experienced Hygienists required significantly shorter scanning times. The current study, however, found no significant differences in performance between operators based on their experience and training background and reflected in their scanning time. In contrast, differences were noted between operator cohorts based on experience regarding their perception of the advantages of the technology. Whilst more experienced dentists reported patient comfort as the main advantage, dental postgraduate students were more concerned with the improved workflow. Dental prosthetist students highlighted the advantages of simplified rescanning of unsatisfactory areas, streamlined workflow, and storage of digital images.

One of the main and recurring hurdles identified in this study impeding the adoption of the intraoral scanning technology was cost. All cohorts universally identified cost as a determining factor as to whether or not they would acquire and use an intraoral scanner. Albeit the overwhelming majority of operators, irrespective of the cohort, initially reported positive expectations and perceptions of the technology and expressed a strong willingness to adopt it in their practice; yet, these expectations and perceptions were not enough to minimise the importance of cost in the decision-making process of acquisition. These findings highlight the importance of reducing the overhead cost of acquiring a scanning system in order to improve accessibility and adoption of the technology as part of routine dental practice. It is also important to note that the calculus of the perceived beneficial gained benefit from adopting IOS versus the overhead cost of acquiring the technology greatly depends on the anticipated applications of the technology in varying clinical practices. In orthodontics, a study identified that intraoral scanning was initially 11 times more expensive than conventional impression making, and required three years of use for the cost to be comparable between the techniques. [10] In contrast, the digital prosthodontic workflow for implant-supported crowns was found to be 18% less expensive than its conventional counterpart. [11] Similarly, a detailed cost-analysis of alginate impression making versus IOS in an Oral and Maxillofacial surgery practice identified that IOS was again less-expensive, and only required 1.04 years to offset the cost outlay in practice when calculated

on the basis of impression making for two patients per working day. [9] Nonetheless, over time, with the increasing demand for new technology, it is expected that the cost will become less of a perceived burden. The acquisition of a digital image of the dentition will continue to evolve and so too will education around this technology.

This study compared three different operator cohorts who have various training backgrounds and levels of experience. One of the aims of this work was to identify differences in performance and perception in training needs and advantages, as well as discerning agreement in expectation, perception of difficulty, accuracy, and cost as important factors in technology acquisition. An understanding of the perceptions and training needs of the various groups of operators will assist in delivering the appropriate level of support when using IOS. The findings of this study are especially pertinent given the fact that impression making falls within the scope of practice of Dental Prosthetists as part of their remit of delivering dental care involving removable dental prostheses, splints, stents, and mouthguards. [23]

A potential limitation of the current study is the selection bias given the participants' initial interest in IOS and participation in the training workshop. However, all eligible participants were invited to be part of the study and there was no reason to assume that those who didn't take part in the study differ to those who participated. The sample size was a homogenous population composed of clinicians and students. Nonetheless, findings cannot be definitively extrapolated to the population of general dentists.

Conclusion

The expectations and perceptions of intraoral scanning were overwhelmingly positive, irrespective of operator training and level of experience. The scanning performance, perceived training needs and advantages depended on the operator's background. Cost of IOS remains an important barrier to acquiring the technology.

Conflict of interest

No conflict of interest was present at the time of conducting this study. The study did not receive any internal or external funding to report.

Authors statement

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Declaration of interests

NONE

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Group	Mean time (seconds)	SD
Prosthetist students	336.50	78.80
Dentists	264.90	57.08
Postgraduate students	240.43	91.33
Total	285.07	83.14

P-Value (Kruskal Wallis test): 0.038

Figure 1: Total time for full-arch scanning (TST) by group

Figure 2. Participants' perceived advantages of intraoral scanning. 'Sent' refers to the direct communication with the laboratory. 'Use' refers to ease of use. 'Materials' refers to the lack of use of consumables. 'Impression' refers to timesaving versus conventional impressions. 'Mess' refers to tidiness versus conventional impression making. Complete responses in Appendix 2.

Figure 3. Participants' perceived disadvantages of intraoral scanning

Table 1. Pre-scanning descriptive statistics

Variables/categories	Pros n =10 n (%)	Dentists n =10 n (%)	Postgrad n=7 n (%)	All n=27 n (%)
<u>Time of degree</u>				
≤ 2 years	9 (90.0)	-	-	9 (33.3)
3-5 years	-	1 (10.0)	2 (28.6)	3 (11.1)
6-10 years	1 (10.0)	1 (10.0)	4 (57.1)	6 (22.2)
11-15 years	-	1 (10.0)	-	1 (3.7)
≥ 15 years	-	7 (70.0)	1 (14.3)	8 (29.6)
P - value <0.01				
<u>Place of degree</u>				
Australia/New	9 (90.0)	2 (20.0)	6 (85.7)	17 (63.0)
Zealand	1 (10.0)	8 (80.0)	1 (14.3)	10 (37.0)
Overseas				
p-value = 0.002				
<u>Previous experience</u>				
Extensive	-	-	-	-
Moderate	-	2 (20.0)	1 (14.3)	3 (11.1)
Minimal	-	5 (50.0)	4 (57.1)	9 (33.3)
None	10 (100.0)	3 (30.0)	2 (28.6)	15 (56.6)
P-value = 0.012				
<u>Expectations</u>				
Very positive	2 (20.)	3 (30.0)	1 (14.3)	6 (22.2)
Somewhat positive	6 (60.0)	7 (70.0)	6 (85.7)	19 (70.4)
Neutral	2 (20.0)	-	-	2 (7.4)
Somewhat negative	-	-	-	-
Very negative	-	-	-	-
P-value = 0.369				

Table 2. Post-training descriptive statistics.

Variables/categories	Prosthetists n =10 n (%)	Dentists n =10 n (%)	Postgrads n=7 n (%)	All n=27 n (%)
<u>Post-training experience</u>				
Very positive	5 (50.0)	8 (80.0)	5 (71.4)	18 (66.7)
Somewhat positive	4 (40.0)	2 (25.0)	2 (28.6)	8 (29.6)
Neutral	1 (10.0)	-	-	1 (3.7)
Somewhat negative	-	-	-	-
Very negative	-	-	-	-
P-value = 0.544				
<u>Level of difficulty</u>				
Very easy	-	2 (20.0)	-	2 (7.4)
Easy	5 (50.0)	3 (30.0)	7 (100.0)	15 (55.6)
Neutral	2 (20.0)	1 (10.0)	-	3 (11.1)
Difficult	3 (30.0)	3 (30.0)	-	6 (22.2)
Very difficult	-	1 910.0)	-	1 (3.7)
P-value = 0.133				
<u>Further training needs</u>				
No training				
Minimal training	2 (20.0)	2 (20.0)	-	4 (14.8)
Moderate training	2 (20.0)	3 (30.0)	6 (85.7)	11 (40.7)
Extensive training	4 (40.0)	5 (50.0)	1 (14.3)	10 (37.0)
P-value = 0.086	2 (20.0)	-		2 (7.4)
<u>Intraoral scanning time</u>				
Very time saving				
Time saving	3 (30.0)	4 (40.0)	1 (14.3)	8 (29.6)
Neutral	3 (30.0)	5 (50.0)	5 (71.4)	13 (48.1)
Time consuming	4 (40.0)	-	1 (14.3)	5 (18.5)
Very time consuming	-	1 (10.0)	-	1 (3.7)
P-value = 0.203	-	-	-	-
<u>Accuracy of intraoral scanning</u>				
Very accurate	1 (10.0)	4 (40.0)	1 (14.3)	6 (22.2)
Accurate	6 (60.0)	5 (50.0)	3 (42.9)	14 (51.9)
Neutral	3 (30.0)	1 (10.0)	3 (42.9)	7 (25.9)
Inaccurate	-	-	-	-
Very inaccurate	-	-	-	-
P-value = 0.360				
<u>Use in dental clinics</u>				
Very likely	5 (50.0)	8 (80.0)	4 (57.1)	17 (63.0)
Likely	5 (50.0)	2 (20.0)	3 (42.9)	10 (37.0)
Neutral	-	-	-	-
Unlikely	-	-	-	-
Very unlikely	-	-	-	-
P-value = 0.356				
<u>Use in own outside practice</u>				

Very likely				
Likely	2 (20.0)	7 (70.0)	1 (14.3)	10 (37.0)
Neutral	6 (60.0)	1 (10.0)	3 (42.9)	10 (37.0)
Unlikely	2 (33.3)	2 (33.3)	2 (28.6)	6 (22.2)
Very unlikely	-	-	1 (14.3)	1 (3.7)
P-value = 0.083	-	-	-	

How cost affects the
acquisition of intraoral
scanner

Very likely	5 (50.0)	1 (10.0)	3 (42.9)	9 (33.3)
Likely	3 (30.0)	8 (80.0)	3 (42.9)	14 (51.9)
Neutral	2 (20.0)	1 (10.0)	1 (14.3)	4 (14.8)
Unlikely	-	-	-	-
Very unlikely	-	-	-	-
P-value = 0.154				