



## Learning styles and preferences of current generation of trainee radiologists: A survey analysis.

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# Introduction

- The current generation of radiology trainees have grown up in the digitalised world and are conversant with digital tools and social media utilisation.
- It has become imperative to study the learning styles, and their preferences to identify gaps in teaching methodology. This might help us decide if its worthwhile to include such methods in their curriculum in order to have a wholesome educational method.
- The goals were to see if there were significant differences in the utilisation and preferences for digital resources with reference to gender, age, years of experience and institute of study.

# Methods

- This qualitative study was undertaken in 2022 targeting Indian radiology trainees and recent Board-certified radiologists (0-5 years experience).
- A questionnaire of 10 questions consisted of understanding preferences for learning tools and styles, problem-solving skills, understanding type of individual learner, preferences for teaching modules, awareness of their role in the department, and preferences for exit-exam pattern.
- Each question had several choices, and each choice had a response option from least-likely to most-likely on a scale of 1 to 5 (Likert scale).
- The data was analyzed using SPSS version 20. The association for age, gender, years of experience, and practicing institute with every aspect of the study questionnaire was assessed using the Chi Square test. P value < 0.05 was considered significant.
- Weighted average was calculated to identify most preferred choice among respondents.

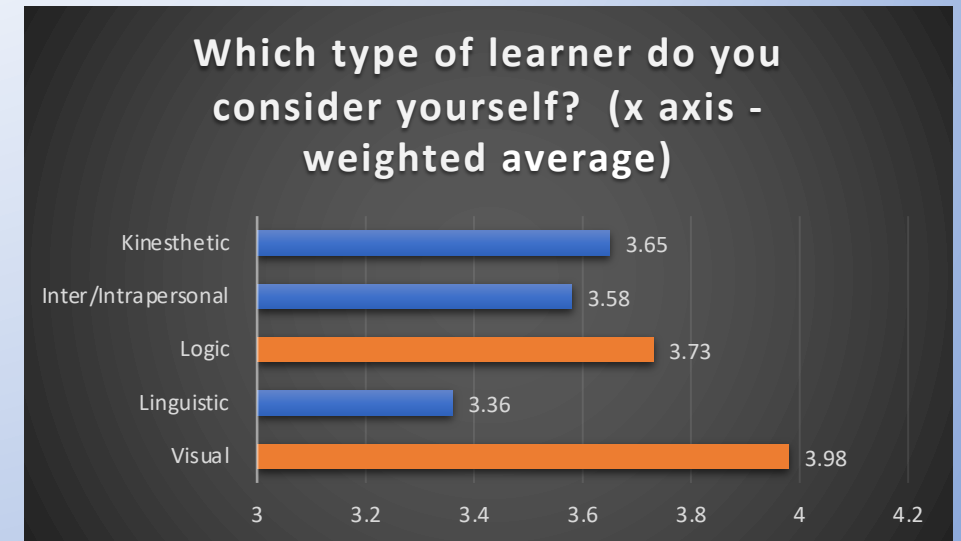
# Questionnaire

List of questions	Options given to score on Likert's scale
<b>Which is your overall preferred mode of learning</b>	<ul style="list-style-type: none"> <li>• Textbooks,</li> <li>• journals,</li> <li>• Teaching websites,</li> <li>• Media channels like YouTube,</li> <li>• conference and lectures.</li> </ul>
<b>When there is need for problem solving which do you use?</b>	<ul style="list-style-type: none"> <li>• Textbooks,</li> <li>• journals,</li> <li>• Teaching websites,</li> <li>• media channels like YouTube,</li> <li>• Ask teachers or peers.</li> </ul>
<b>For regular system wise learning (eg neuro) which do you use?</b>	<ul style="list-style-type: none"> <li>• Monograph textbook on sub speciality,</li> <li>• standard,</li> <li>• Comprehensive textbooks,</li> <li>• journals,</li> <li>• teaching websites,</li> <li>• media channels like YouTube.</li> </ul>
<b>Which type of learner do you consider yourself?</b>	<ul style="list-style-type: none"> <li>• Visual (diagrams, videos, cartoon etc),</li> <li>• Linguistic (verbal, text book),</li> <li>• Logic (algorithmic, reasoning),</li> <li>• Inter/Intrapersonal (group learning/self learning)</li> <li>• Kinesthetic ( action, by doing)</li> </ul>

List of questions	Options given to score on Likert's scale
<b>Which would you like to see incorporated into training modules?</b>	<ul style="list-style-type: none"> <li>• Interactive platforms like google blackboard/Camtasia,</li> <li>• Flipped classroom (topic assigned earlier to learn on your own way and then discussed in a forum),</li> <li>• Seminars by students/teachers,</li> <li>• Interactive case based discussions and spotters,</li> <li>• Simulation modules</li> </ul>
<b>To what extent are the follow true of you?</b>	<ul style="list-style-type: none"> <li>• Aware of your course curriculum and expected learning outcomes;</li> <li>• Have well defined goals set for you by your trainers for each module,</li> <li>• Regular review and feedback from instructors,</li> <li>• Participation in creating learning goals and methods,</li> <li>• Systematic and periodic planned assessments</li> </ul>
<b>Which mode of practical exam do you prefer?</b>	<ul style="list-style-type: none"> <li>• Single centralised exam ( like single exit exam,)</li> <li>• Institutional and local (at your hospital/university);</li> <li>• combination (central and regional),</li> <li>• Completely online ( like EDiR),</li> <li>• Combination of online and on site ( like FRCR).</li> </ul>

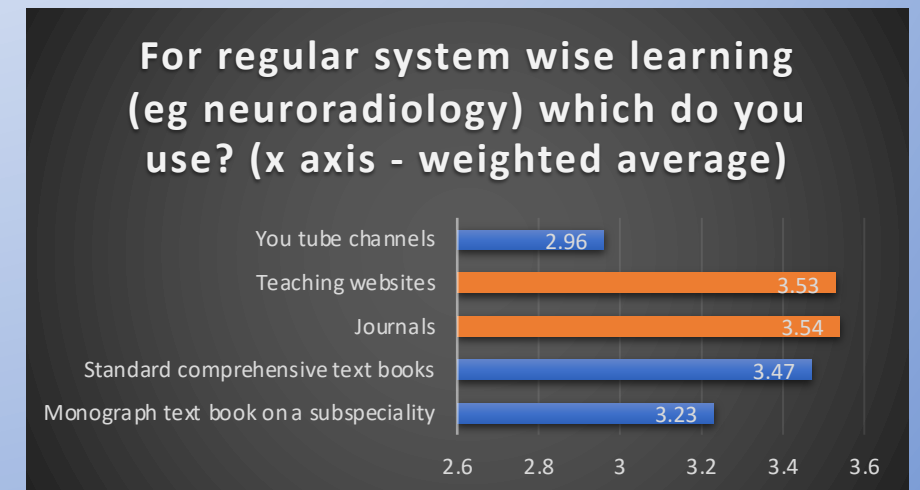
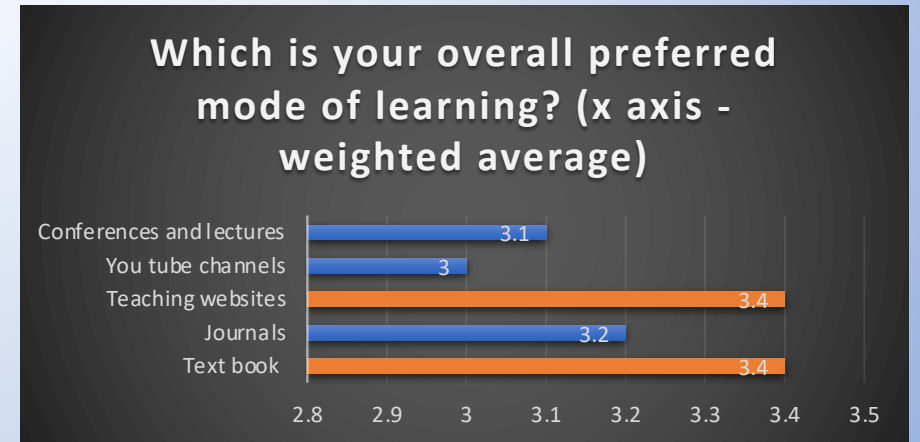
# Results & Discussion

- 119 participants responded to the survey, with 68 males, 50 females, and 1 other category.
- The age range of the participants was 20 to 40 years old, with 59 (49.5%) falling into the 25-29 year old age group. Nearly 97% of the participants belonged to Generation Y. 64% belonged to first three years of residency.
- The majority of the participants identified themselves as visual learners, followed by logical and kinaesthetic learners.
- No significant statistical differences were found in learning style preferences based on gender, years of experience, or institute of study.



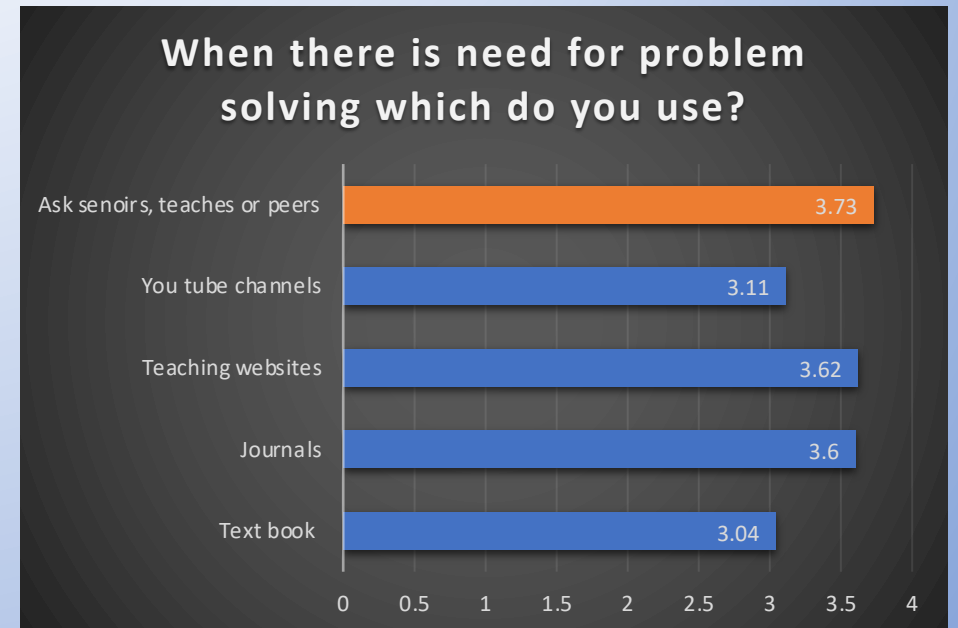
# Preference for learning tools

- Teaching websites and textbook were most **overall preferred mode of learning** followed by journals, conferences, lectures and video media channels, latter being the least preferred.
- For system wise learning, teaching website and journals were most preferred tools.
- A statistically significant difference in the use of journals was observed in different institution groups. Trainees at university affiliated hospitals preferred journals than trainees at other institutions.



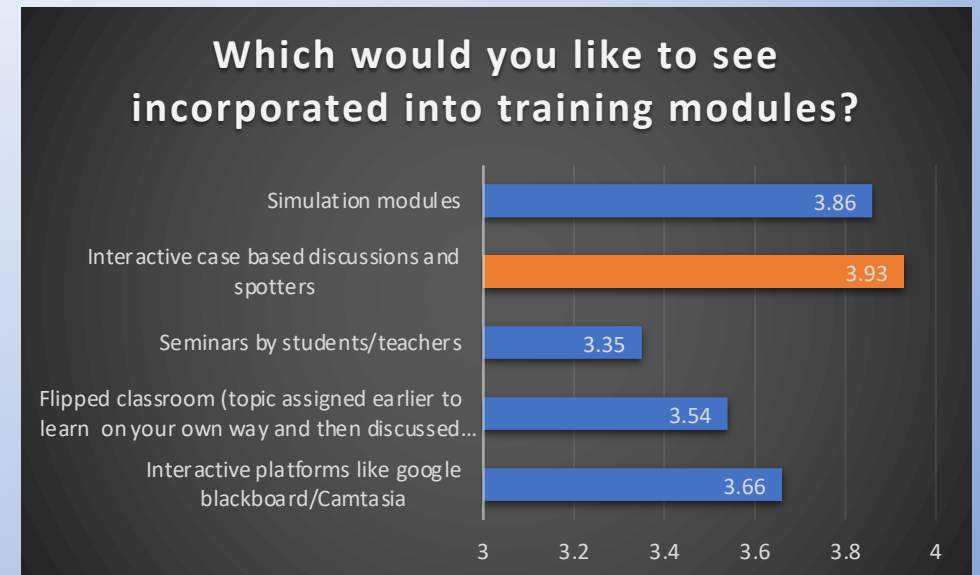
# Problem solving preferences

- Responders tend to prefer consulting teachers and peers followed by utilizing help of teaching websites and journals.
- In our survey, only 36% first-year residents preferred teaching website for problem solving as compared to 81% of fourth year residents, indicating increasing trend with increase in years of experience.
- Overall, textbook was the least preferred choice for the same.
- However, 63% of 4<sup>th</sup> year exam appearing trainees tend to prefer textbook among others.



# Preference in teaching modules

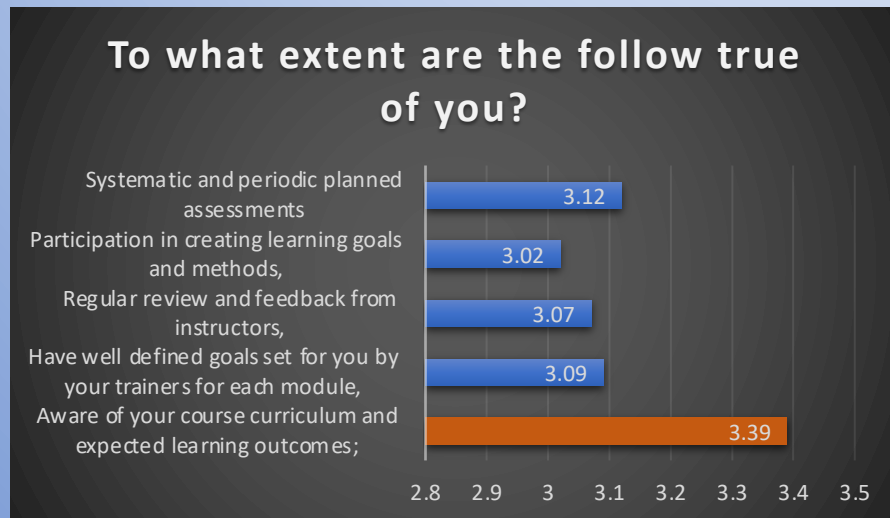
- Majority preferred interactive case-based discussions followed by simulations. With increase in years of experience, case based discussions and flipped classrooms were preferred.
- Male preferred interactive case base discussions more than females (statistically significant).
- There was also an increasing trend in the preference for simulation with experience, with 79% of third-year trainees and 81% of fourth-year trainees preferring this teaching module.





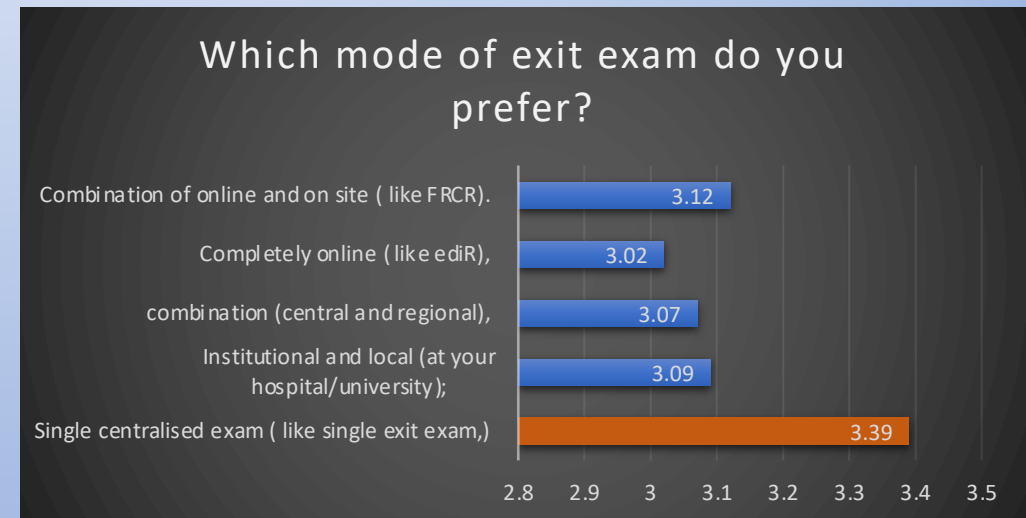
## Awareness of role in department

- Statistically significant increasing trend was seen for awareness of curricular goals with gender (males being more aware).
- Females were less aware of feed backs and reviews as opposed to males.



## Preference for exit exam

- Majority favoured institutional and local exam.
- Exclusively online exam was least preferred. This is the only question to have few negative ratings.
- Interestingly , no statistical difference was seen among different institutes .
- Males preferred spotters and long cases as opposed to females.



# Conclusion

- Being technology savvy, and visual learners, more versed with e-learning; current generation's learning styles are different from preceding generations which relied on didactic lectures and textbooks. However, they do require precise instructions, simulations and personal mentoring. Minor variations exists for gender, years of experience and institute of study but that does not seem to detract from the broad trend.
- Overall, studying learning patterns is a valuable tool for educators who want to improve student learning outcomes.
- By understanding how students learn, educators can create more effective learning experiences that are tailored to individual learners' needs and strengths.

